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STATE OF ILLINOIS  
DEPARTMENT OF MINES AND MINERALS  
LAND RECLAMATION DIVISION

MINE POLLUTION  
CONTROL PROGRAM

BRAD EVILSIZER  
DIRECTOR

MEMORANDUM

227 SOUTH 7TH ST. - RM. 201  
SPRINGFIELD, ILLINOIS 62706  
TELEPHONE: (217) 782-4970

TO: Steve Chard, Department of Agriculture  
Richard W. Lutz, Department of Conservation  
Ron Barganz, Environmental Protection Agency  
Edwin Bakowski, Environmental Protection Agency  
David R. Boyce, Department of Transportation

FROM: Ernest Aspy, Permit Coordinator  
Land Reclamation Division

DATE: April 15, 1986

RE: Surface Mining Interagency Committee

Enclosed please find written findings for Consolidation Coal Company, Burning Star #4 Mine, surface coal mining and reclamation operations permit application #152. Under Rule 1786.23(d) this is considered the Department's final action.

Also, enclosed are modifications submitted by Consolidation Coal Company, Burning Star #4 Mine, surface coal mining and reclamation operations permit application #152 requested by the Department in its letter of May 29, 1985.

EA:lb  
Attachment  
cc: OSM  
D. Downing  
T. Johnson  
A. Meyer  
R. Zinszer

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MINE POLLUTION CONTROL PROGRAM  
MARION, ILLINOIS

NOVA DIVISION OF RECORDS MANAGEMENT  
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REVIEWER: JKS

3001A-85

Results of Review of  
Permanent Program Permit Application #152,  
Consolidation Coal Company, North Field/East  
Burning Star #4, SM-1 Application

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MINE POLLUTION  
CONTROL PROGRAM

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MINE POLLUTION CONTROL PROGRAM  
MARION, ILLINOIS

EPA DIVISION OF RECORDS MANAGEMENT  
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REVIEWER: JKS



The Illinois Department of Mines and Minerals, the Regulatory Authority in Illinois under the Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. §1201 et seq. has reviewed in accordance with 62 Ill. Admin. Code Section 1786 of the Department's Permanent Program rules, Consolidation Coal Company's Burning Star #4 Mine, North Field/East surface coal mining and reclamation operations permit application.

Consolidation Coal Company submitted in writing the modifications required by the Department's May 29, 1985, letter (Appendix A). These modifications have been reviewed and approved by the Department. Pursuant to Section 1786.23 of the Department's Rules, the Department has decided to approve the application as modified. The Department's decision is based upon a review of the record as a whole, and is supported and documented by the record. The statement below gives the findings and reasons for the Department's decision. The period for administrative review (Section 1787.11) commences as of the date of this decision.

#### I. SUMMARY OF PERMIT APPLICATION NO. 152

Surface coal mining and reclamation operations permit application No. 152 submitted by Consolidation Coal Company for its Burning Star #4 Mine, North Field/East, requests a permit for 2,044 acres.

Of the 2,044 acres, proposed for the permit area, 1,975.5 acres are proposed to be surface mined and 68.5 acres are proposed for other related uses.

Consolidation Coal Company has shown pre-mining and post-mining land uses as follows:

	<u>Pre-Mining (Ac.)</u>	<u>Post-Mining (Ac.)</u>
Cropland	1,306.9	1,306.9
Pastureland	145.4	22.0
Forestry	432.9	221.8
Residential	50.6	16.9
Industrial (public road)	31.9	11.2
Wildlife Habitat(riparian forest)	0.0	278.0
Water	38.9	186.9
Undeveloped Land	37.4	0.3
<b>TOTAL</b>	<b>2,044.0</b>	<b>2,044.0</b>

END SECTION

#### II. PROVISIONS FOR PUBLIC PARTICIPATION

The Department finds that the public participation requirements of Section 1786.11 - 1786.16 have been met.

The 2,044-acre application was filed with the Department on November 20, 1984, and deemed complete on December 5, 1984. The applicant placed a newspaper advertisement of the proposed operation in the Pinckneyville Democrat, a paper of general circulation in the area affected, published in Perry County, once a week for 4 continuous weeks beginning on December 26, 1984. The applicant filed two copies of the permit application with the

County Clerk of Perry County, in accordance with Section 1786.11(d)(1), on December 20, 1984. Copies of the application were sent to the Interagency Committee (IAC) and the U.S.D.A. Soil Conservation Service on January 2, 1985, for review and comment. Written notification of the application was given to those governmental agencies and entities required to receive notice under Section 1786.11(c).

Interagency comments on this application have been received by the Department, with the source and date of comments as follows: Illinois Department of Agriculture (February 7, 1985); Department of Conservation (February 5 & February 8, 1985); and the Environmental Protection Agency (February 14, 1985).

Comments on this application were received from the U.S.D.A. Soil Conservation Service dated January 25, 1985.

All comments received on Application #152 have been furnished to Consolidation Coal and have been filed for public inspection at the office of the Perry County Clerk.

Pursuant to Section 1786.23(b)(2)(i), Consolidation, by letter dated January 8, 1985, waived the 120-day permit review time limit.

### III. SUMMARY OF THE DEPARTMENT'S FINDINGS

The Department, upon completing its review of the information set forth in the application, the required modifications submitted (see Appendix A) and information otherwise available, as described below, and made available to the applicant, and after considering the comments of the Interagency Committee, and all other comments received, makes the following findings:

#### A. Findings Required by Section 1786.19

1786.19(a) The permit application as modified is accurate and complete and all requirements of the Surface Coal Mining Land Conservation and Reclamation Act, regulations and the regulatory program have been complied with.

1786.19(b) Consolidation Coal Company, Burning Star #4 North Field/East Mine, has demonstrated surface coal mining and reclamation operations as required by the Act, regulations and regulatory program can be feasibly accomplished under the proposed mining and reclamation plan as modified.

1786.19(c) The Department has assessed the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance and found that the operations proposed under the application have been designed to prevent damage to the hydrologic balance outside the proposed permit area. See Appendix C.

1786.19(d) (1) The proposed permit area is not included within an area designated unsuitable for surface coal mining operations under Section 1764.

- (2) The proposed permit area is not within an area under study for designation as unsuitable for surface coal mining operations in an administrative proceeding begun under Section 1764.
- (3) The application does not include any lands within the boundaries of the National Park System, the National Wildlife Refuge System, National Systems of Trails, National Wilderness Preservation System, Wild and Scenic Rivers System, and National Recreation areas.
- (4) The Department finds that subject permit is not within 300 feet measured horizontally of any public school, church, community, or institutional building, or public park, or within 100 feet measured horizontally of a cemetery.
- (5) The proposed permit area is within 100 feet of the outside right-of-way line of public roads in Perry County, described as follows:

A public road running east and west, located on the north section line of Sections 22 and 23, T5S, R4W, Perry County, known as Illinois Route 154.

A public road along the south side of the MoPac Railroad along the south line of Section 34, T5S, R4W, Perry County, to the railroad, thence northeast along the railroad to the east line of the northeast quarter of Section 35, T5S, R4W, Perry County.

A public road running north and south along the east quarters of Sections 23 and 26, T5S, R4W, Perry County, from Route 154 on the north, south to the center of Section 26, T5S, R4W, Perry County.

As provided by Section 1761.12(c), the applicant provided proper public notice of an opportunity for public hearing. No hearing was requested, and no written comments were submitted to the Department. The Department finds the interests of the public and affected landowners will be protected from the proposed mining operations as a result of the measures to be taken by Consolidation Coal Company described in the mining operations plan concerning these roads.

- (6) The proposed permit area is within 300 feet of an occupied dwelling owned by V. Gielow. The Department has determined that the applicant has submitted in the application and the modifications required by the Department sufficient documentation to demonstrate that the applicant has valid existing rights for land tract #026-175. Surface coal mining and reclamation operations proposed on land tract #026-175 may be conducted within 300 feet of the occupied dwelling. For land tract #026-192 a condition has been placed on the permit requiring the applicant to observe a 300 foot buffer zone between the occupied dwelling and any surface coal mining and reclamation operations. See permit condition B4 at Part IV of finding.

1786.19(e) The proposed operations will not adversely affect any publicly owned parks or public places included in the National Register of Historic Places except as provided for in Section 1761.11(c).

1786.19(f) The private mineral estate to be mined has not been severed from the private surface estate.

1786.19(g) The Department has determined and finds from the schedule submitted in the application in accordance with Section 1778.14(c) and other information available to the Department that the applicant is not currently in violation of any law, rule, or regulation of the U.S. or of any state law, rule or regulation enacted pursuant to federal law, rule, or regulation or of any provision of the Act pertaining to air or water environmental protection.

1786.19(h) The applicant will submit fees required by these regulations before the permit is issued. The fee required is \$248,650.00 for the term of the permit, which may be paid in annual increments. The Department finds that the applicant has paid fees required under 30 CFR Chapter VII Subchapter R.

1786.19(i) The applicant does not control and has not controlled mining operations with a demonstrated pattern of willful violations of the Act of such nature, duration and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act.

1786.19(j) Surface coal mining and reclamation operations to be performed under the permit will not be inconsistent with other such operations anticipated to be performed in areas adjacent to the proposed permit area during the permit period.

1786.19(k) The applicant will be required to submit a performance bond or other equivalent guarantee required under Sections 1800-1808 prior to issuance of the permit. The amount required is \$19,834,419.

1786.19(l) The applicant has, with respect to prime farmland, satisfied the requirements of 1785.17.

A soil survey has been submitted by the applicant which shows there are 1,268.4 acres of prime farmland soils identified on this permit area.

The applicant has requested a negative determination on 101.0 acres of prime farmland soils. The applicant has provided adequate justification that shows that the 101.0 acres have not been historically used as cropland. A negative determination is hereby granted by the Department for the 101.0 acres of prime farmland. These acres will be reclaimed to high capability standards. See Appendix D.

The applicant has also obtained grandfathering exemption on 1094.0 acres of the prime farmland soils under Opinion and Order 83-3. See Appendix D and Appendix G. The remaining 73.4 acres of prime farmland will be reclaimed to prime farmland standards under a prime farmland restoration plan proposed by the applicant. See Appendices D, E, F and G.

1786.19(m) The Department has approved the proposed post-mining land use of the permit area in accordance with the requirements of Section 1816.133 (see Appendix D).

1786.19(n) The Department has made all of the specific approvals required under Sections 1810-1828 as noted below:

1816.49(a)(1) Based upon the hydrologic balance assessment performed and reported in Appendix C, the permit applicant has demonstrated the quality of the impounded water will be suitable on a permanent basis for its intended use, and discharge of water from the impoundment will not degrade the quality of receiving waters to less than water-quality standards established pursuant to applicable State and Federal Laws.

(2) The permit application provides adequate data to demonstrate the level of water will be sufficiently stable to support the intended use.

(3) The permit application provides plans ensuring adequate safety and access to the impounded water will be provided for potential users.

(4) As spelled out in Appendix C, the permit application demonstrates the permanent water impoundment will not result in the diminution of the quality or quantity of water used by adjacent or surrounding landowners for agricultural, industrial, recreational, or domestic uses.

(5) As all proposed permanent impoundments are excavated (incised) and therefore do not involve constructed structures, they are not subject to the requirements set forth in Section 1816.49(a)(5).

(6) The application has demonstrated the size of the impoundment is adequate for the proposed intended purposes of the impoundment. The Department believes each of the proposed permanent impoundments is compatible with at least one of the proposed uses.

(7) Likewise, the application demonstrates the impoundment will be suitable for the approved post-mining land use. The proposed land uses for areas surrounding the impoundment are pasture, cropland, and wildlife habitat, all of which are compatible and consistent with water resources.

These impoundments will be used for irrigation, livestock watering, recreation and fish and wildlife habitat. In addition, they will provide aesthetic diversity. These impoundments are important in that they in a small degree help replace the wetlands that have been extensively drained in Illinois and throughout the prairie regions of North America. Also, the great quantities of water stored in these impoundments and associated spoil areas will someday be a valuable resource in and of itself. A growing society requires increased supplies of relatively high quality water. The useable sources of this resource are rapidly being depleted. Sooner or later, these impoundments will be an important source of water to the state and nation.

1816.112 The applicant is not proposing the use of introduced species as a substitute for certain native species in the modified application.

The Department finds native species or naturalized species to be more desirable in the establishment of forest and wildlife plantings. The applicant should utilize native or naturalized species when they are available. To aid in the assurance of availability of planting stock, the operator should pursue early contact and ordering with the state nurseries and other commercial nurseries.

1786.19(o) After reviewing the entire record in this matter, the Department finds the proposed activities will not affect the continued existence of endangered or threatened species or result in the destruction or adverse modification of their critical habitats.

1786.19(p) All comments received have been considered by the Department in reviewing this application. The Department's responses to these comments are set out in Appendix B.

#### B. Findings Required by Section 1786.21

On the basis of information provided by the applicant to the Department pursuant to Section 1780.12, on the basis of information set forth in the complete application as modified, and pursuant to the exemption provided in Section 1700.11(d)(1)(i), the Department finds the applicant's proposed use of existing structures (mine roads, ditches, culverts and sediment ponds) meet the performance standards of the Act and Sections 1810-1828. No significant harm to the environment or public health or safety will result from the use of the structure.

#### C. Applicable Section 1785 Discussions

After a review of all parts of Section 1785 including experimental practice mining, steep slope mining, mountaintop removal, etc., none of those categories applies to Burning Star No. 4, North Field/East site. For discussion of prime farmland requirements see finding at Part III, Section A, 1786.19(1).

#### D. Findings Required By Section 1786.23

1786.23(a) The Department has based its decision to approve as modified Consolidation Coal Company's Burning Star #4, North Field/East, Application #152 on the complete application, public participation, compliance with all applicable provisions of Section 1785 and the processing and complete review of the application.

1786.23(b) On January 8, 1985, the applicant in a letter to the Department waived the 120-day time limitation. The Department has taken action as required by Section 1786.23(a) within the time frame provided under 1786.23(b)(2)(i).

1786.23(c) This provision does not apply since an informal conference was not held.

1786.23(d) The Department is providing its written findings concerning this application and stating the specific reasons for the decision to the permit applicant.

1786.23(e) The Department is simultaneously providing a copy of its decision to each person and each government official who filed a written objection or comment with respect to the application, to the Perry County Board, and to the Office of Surface Mining, together with a copy of the permit issued as required by 1786.23(e). The Department is publishing a summary of its decision in a newspaper of general circulation in the general area of the proposed operation.

1786.23(f) Within 10 days after the granting of a permit, including the filing of the performance bond or other equivalent guarantee which complies with Sections 1800-1808 of these regulations, the Department shall notify the local government officials in Perry County that a permit has been issued and shall describe the location of the lands within the permit area.

All materials supporting these findings are a part of the public record and are hereby incorporated by reference. Based upon the information contained in the permit application, information otherwise available and made available to the applicant, the comments of the Interagency Committee, all findings and information contained herein, and conditions set forth in Part IV, the Department is issuing this decision approving as modified the application of Consolidation Coal Company, Burning Star #4, North Field/East Mine.

Enter on behalf of the Illinois Department of Mines and Minerals, Land Reclamation Division as Regulatory Authority.



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Brad Evilsizer, Director  
Illinois Department of Mines and  
Minerals

Dated: April 3, 1986

#### IV. Permit Conditions

##### A. General and Right of Entry

1. The permittee shall conduct all surface disturbance, coal mining and reclamation operations as described in the complete application, except to the extent the Department otherwise directs in the permit, as modified, that specific actions be taken.

2. The permittee shall allow the authorized representatives of the Department, without advance notice or a search warrant, upon presentation of appropriate credentials, and without delay, to--

(a) Have the right of entry provided for in Sections 1840.12 and 1840.15; and

(b) Be accompanied by private persons for the purposes of conducting an inspection in accordance with Sections 1840 and 1842, when the inspection is in response to an alleged violation reported to the Department by the private person.

3. The permittee shall conduct surface disturbance, coal mining and reclamation operations only on those lands specifically designated on the maps submitted under Sections 1779 - 1780 or 1783 - 1784 and approved for the term of the permit and which are subject to the performance bond or other equivalent guarantee in effect pursuant to Sections 1800 - 1808.

##### B. Environment, public health, and safety.

1. The permittee shall minimize any adverse impact to the environment or public health and safety resulting from noncompliance with any term or condition of this permit, including, but not limited to:

(a) Accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance;

(b) Immediate implementation of measures necessary to comply with; and

(c) Warning, as soon as possible after learning of such noncompliance, any person whose health and safety is in imminent danger due to the noncompliance.

2. The permittee shall dispose of solids, sludge, filter backwash, or pollutants removed in the course of treatment or control of waters or emissions to the air in the manner required by Sections 1810 - 1828 of these regulations, the regulatory program, and which prevents violation of any applicable state or federal law.



3. The permittee shall conduct its operations--

(a) In accordance with any measures specified in the permit as necessary to prevent significant, imminent environmental harm to the health or safety of the public; and

(b) Utilizing any methods specified in the permit by the Department in approving alternative methods of compliance with the performance standards of the Act and the regulatory program, in accordance with the provisions of the Act, 1786.19(m) and Sections 1810 - 1828.

(c) Success of reclamation and vegetation shall be assessed in accordance with guidelines for comparison of the restored area to reference areas or other techniques for measurement of productivity (which consider local rainfall amounts, soil types, required levels of management, etc.) as adopted by the Department at the time of demonstration of productivity or ground cover.

4. No surface coal mining operations are to be conducted on land tract #026-192 within 300 feet from the occupied dwelling located at the north-east border of this permit area. Consolidation Coal Company is to stake off a 300-foot buffer zone and clearly mark such as a buffer zone and Consolidation Coal Company shall locate no surface coal mining operations within this buffer zone. This condition may be removed if Consolidation Coal Company provides the requisite document (provide written waiver from the owner of the dwelling) under Section 1761.11(e).

APPENDIX A



STATE OF ILLINOIS  
**DEPARTMENT OF MINES AND MINERALS**

**LAND RECLAMATION DIVISION**

May 29, 1985

**BRAD EVILSIZER**  
DIRECTOR

227 SOUTH 7TH ST. - RM. 201  
SPRINGFIELD, ILLINOIS 62706  
TELEPHONE: (217) 782-4970

CERTIFIED MAIL  
552 664

Mr. Victor Ordija  
Consolidation Coal Company  
Midcontinent Region  
12755 Olive Boulevard  
St. Louis, MO 63141

Dear Mr. Ordija:

The Department, after reviewing the information contained in the permit application and information otherwise available, and made available to the applicant, and after considering the comments of the Interagency Committee, and all other comments received, has determined that modification of the Consolidation Coal Company's Burning Star #4, North Field/East Mine permit application No. 152 is necessary. The modifications required by the Department are enclosed here. Absent the modifications required by the Department, the application does not demonstrate compliance with the requirements of the Illinois Surface Coal Mining Land Conservation and Reclamation Act, Regulations and Regulatory Program.

The Department will issue a decision approving the Consolidation Coal Company's Burning Star #4, North Field/East Mine, Permit application No. 152 when it receives and approves the modifications specified. If the applicant does not desire to modify the permit application as described below, it may, by filing a written statement with the Department, deem the permit application denied, and such denial shall constitute final action.

The period for administrative review (Rule 1787.11) shall commence upon:

- 1) receipt by the applicant of a written decision from the Department, approving the application as modified;  
or
- 2) if the applicant's modifications are insufficient, or if the applicant fails to submit the required modifications to the Department within the time period prescribed below, receipt by the applicant of a written decision from the Department denying the permit application; or
- 3) receipt by the Department of the applicant's denial statement.

The modifications to the application shall comply with the requirements of Rule 1771.27. The applicant shall respond in writing to the modifications and requirements contained herein within 30 days of the date of receipt, or, for reasonable cause and upon timely written request to the Department, such later date as the Department may determine.

The modifications required by the Department are as follow:

- 1) Pursuant to 1778.18, the applicant must modify the application by providing a current certificate of insurance. The certificate submitted with the application expired January 1, 1985.
- 2) Pursuant to 1778.13(a)(2), the applicant must modify the application at Part I(2) to provide complete ownership information of the permit and contiguous area. The applicant indicates in the Property Control Data that some land is leased; however, Part I(2) of the application states that the applicant owns the permit and contiguous area. Please explain this discrepancy and if some land is leased, provide ownership information and show the boundaries of those lands on the Pre-Mining Map.
- 3) Pursuant to 1779.22(a)(2), the applicant must modify the application at Part II(5) to include a narrative of land capability and productivity. The applicant's response at Part II(5) does not include this information as required by 1779.22(a)(2).
- 4) Pursuant to 1779.24(a), the applicant must modify the application on the Pre-Mining Map to indicate boundaries of lands and names of owners of record of both surface and subsurface on and within 1,000 feet of the proposed permit area. The applicant failed to designate boundaries of lands owned by individuals.
- 5) Pursuant to 1779.24(d), the applicant must modify the application on the Pre-Mining Map to indicate location and identify the current use of all buildings on and within 1,000 feet of the proposed permit area. The applicant failed to identify current building uses as required.
- 6) Pursuant to 1779.24(e), the applicant must modify the application on the Pre-Mining Map to locate surface and subsurface features passing through or over the proposed permit area. Specifically, the applicant must provide location of electric transmission lines.
- 7) Pursuant to 1779.25(e), the applicant must modify the application on the Mining Operations Map to provide location and extent of the known abandoned underground mine. The applicant indicates at Part II(4) that the old underground works exists as shown on the Mining Operations Map; however, old works are not indicated on this map or any other map submitted with the application.

- 8) Pursuant to 1780.14(b)(1), the applicant must modify the application on the Mining Operations Map to locate utility corridors. The Mining Operations Map submitted with the application provides a symbol for utility corridors in its legend; however, the map itself locates no utility corridor.
- 9) Pursuant to 1780.14(b)(10), the applicant must modify the application on the Mining Operations Map to locate explosive storage and handling facilities, if any. The Department assumes such facilities will be utilized in this area for convenience sake.
- 10) Pursuant to 1780.23(a), the applicant must modify the application at Part V(2)(B) to include a discussion of the utility and capability of the reclaimed land to support a variety of alternative uses. The applicant failed to provide this discussion as required.
- 11) Pursuant to 1780.23(b), the applicant must modify the application at Part V(2)(B) to provide a copy of comments received from owners of land concerning proposed post-mining land uses. As indicated in Modification #2 of this letter, it appears that there is land leased from individuals. The applicant must solicit comments from these individuals as to proposed post-mining land uses and supply the Department with a copy of those comments. In addition, it appears that from comments received from Dorothy Zimmerman, Melvin Zimmerman, Erna Edler, Olin Edler, Laurina Caupert, Iona Caupert, William Launhardt, and Annette Kuehner that the proposed reclamation plan for their properties is not consistent with their lease or their wishes. As required by 1780.23(a)(4), please account for landowners' plans for their properties.
- 12) Pursuant to 1780.18(b)(5)(iv), the applicant must modify the application at Part V(4)(G) to discuss mulching rates and techniques. To ensure compliance with 1816.114, the applicant must use a dry (or straw) mulch or obtain approval from the Department on a case by case basis for using annual grasses or grains alone. The applicant only proposes to use companion crops as mulch.
- 13) Pursuant to 1786.19(a), the applicant must modify the application on the Reclamation Plan Map to show the location of hedgerows. The Reclamation Plan Map submitted with the application provides a symbol for hedgerows in its legend; however, the map itself does not locate hedgerows. As indicated in the Department of Conservation's comments, these hedgerows are necessary to provide wildlife travel corridors and they serve to conserve soil. Please provide the locations of hedgerows.

- 14) Pursuant to 1786.19(b), the applicant must modify the application to provide a discussion that will ensure compliance with 1816.23. The applicant on the submitted Mining Operations Plan locates haul roads passing through designated topsoil stockpile locations. Please explain how the applicant will ensure compliance with 1816.23 in these areas.
- 15) Pursuant to 1786.19(a), the applicant must modify the application at Part IV(1) to provide marker descriptions for topsoil stockpiles and buffer zones. This information is necessary to ensure compliance with 1816.11(e).
- 16) To ensure compliance with 1786.19(d)(5), the applicant must modify the application to address the applicant's right to affect within 300 feet of an occupied dwelling either through valid and existing rights or by written waiver from the owners as per 1761.11(e) and 1761.12(d). The Pre-Mining Map submitted with the application indicates that there may be some occupied dwellings within 300 feet of the proposed permit area.
- 17) Pursuant to 1786.19(a), the applicant must modify the application to explain a discrepancy on the Reclamation Plan Map. The Reclamation Plan Map submitted with the application provides a symbol for a ditch in its legend; however, the map itself locates no ditch, nor does the Reclamation Plan narrative address a permanent ditch. Please explain this discrepancy.
- 18) Pursuant to 1780.18(b), the applicant must modify the application at Part IV(5)(G) to provide a response as to area closure or abandonment. The applicant's response is not adequate. Please provide the information required by the question.
- 19) Pursuant to 1786.19(a), the applicant must modify the application at Part V(4)(E) to provide a complete response. The applicant's response is cut off in mid-sentence.
- 20) Pursuant to 1779.25, response II-10-C, D & E, pages II-5 and II-7, Volume I, must be modified to change soil Hickory-Marseilles (913) to Hickory-Wellston (900).
- 21) Pursuant to 1779.27, responses Vol. I, II-10-C, pages II-7 -II-9 and Vol. II, V-12-A-2, pages A-10 & A-11 must be modified to include all lands subject to 1823.11 in the prime farmland restoration plan. Changes in the acreage will also affect response V2, page V-2, Volume 1, response V4, page V-5, Volume 1, and the Reclamation Map. Additionally, the Reclamation Plan and Map need to identify which acreages are subject to the productivity standards of IDMM memorandum dated July 8, 1982.

- 22) Pursuant to 1785.17(d), response V12-A-3-e and 4, pages A-29-46, Vol. II and A-298 Vol. II must be modified to account for the prime farmland acreage changes reflected in the preceding question.
- 23) Pursuant to 1823.14 and 1823.12, response V-12-B-1 must be modified to clarify the proposed texture limits are for prime fragipan soils or to include additional justification to support the proposed limits.
- 24) Pursuant to 1823.13, response V-12-B-6-(b), page B-5, Volume II, must be modified to correctly give the texture class of the non-prime topsoil and prime topsoil.
- 25) In reviewing the reclamation plan map and the reclamation plan map for Permit #74 (adjoining area) it appears that the proposed access road in this application has no point of access from a county road. Pursuant to 1786.19(b), the applicant must modify the application to correct this error.
- 26) Pursuant to 1786.19(a) and to ensure compliance with 1816.99(c), the applicant must modify the application at Part IV(3) to locate and address lateral support removal. In reviewing the operations plan map submitted with the application that blasting limits indicate that lateral support limits may be approached in several locations, please provide the required information.
- 27) In accordance with 62 Ill. Adm. Code 1780.13 and in order to ensure compliance with 72 Ill. Adm. Code 1816.64(a)(2), the application shall be modified to include a list of residents, local governments, and utilities to whom the blasting schedule will be forwarded.
- 28) Pursuant to 1779.15, the applicant shall modify information concerning municipal groundwater supplies listed in Part III-2-G of the permit application. In this part the applicant refers to Mississippian sandstones as being the primary bedrock aquifer. This is also mentioned in other places as well. However, in such references as Woeller (1975, Public groundwater supplies in Perry County, ISGS Bull. 60-13) the source is listed as Pennsylvanian sandstones and Mississippian limestones. This apparent discrepancy shall be corrected.
- 29) Pursuant to 1779.14, the applicant shall clarify the results of analysis of the coal processing waste material as provided in Part IV-6-A of the application. Specifically, the net neutralization potential is listed as 200 tons  $\text{CaCO}_3$  per 1000 tons material. However, there is no designation as to whether this is a + or a - value.

- 30) To assure compliance with 1816.52(a), the applicant shall provide additional information regarding their proposed ground-water monitoring plan. Specifically, no Schedule B was provided for monitoring well MW4-5. Additionally, it is not clear if well MW4-D-1 is meant to be a part of the monitoring program for this permit area. Therefore, the applicant shall clarify their intended monitoring program and provide Schedule B for all intended monitoring wells.
- 31) Pursuant to 1780.21(a), the applicant shall provide a response to Parts V-10-A-1 and 3 of the permit application. In the narrative provided for this part in the application, no direct response could be found for these parts.
- 32) Pursuant to 1786.19(b) and to ensure compliance with 1816.112, the applicant must modify the application at Part V(6)(C) to delete the three non-native pine tree species from their planting list. The applicant should follow the recommendation of the Department of Conservation in their comments.
- 33) The Department is requiring the applicant to provide detailed descriptions of at least two reference points (i.e., starting point and backsight) if the permit boundary is to be located by survey traverse. Rule 1786.19(a) requires the permit application to be accurate and complete. The procedure described for marking the permit boundary is not considered to be accurate and complete as it could not be reproduced in the field on the basis of information provided in response to Part II(1) of the application.
- 34) In order to ensure compliance with Rule 1816.44(b), the following modifications must be submitted for diversion ditch A:
  - (a) The watershed limits upstream from the diversion must be indicated.
  - (b) The applicant's use of a design CN of 70 for this diversion is unacceptable unless additional information supporting this value is submitted. Diversion A must be redesigned based on a revised CN.
- 35) In order to assure compliance with Rule 1816.43 and 1816.44, the Department will require the following:
  - (a) The location of ditch H must be shown on the surface drainage control map.
  - (b) A design for a permanent waterway to direct the drainage from the ditch H watershed to the north incline must be submitted.
  - (c) The applicant must submit a ditch spoil grading plan for ditches H and A.
  - (d) Specific Departmental approval will be required prior to routing drainage through ditch A and ditch H.

- 36) To assure compliance with Rule 1816.42(a), the applicant must submit a drainage control plan for areas under reclamation.
- 37) As requested in application Part IV(6)(b), the applicant must indicate locations of incline gob disposal areas on the mining operations map. Incline gob disposal will not be permitted within the permanent stream relocation corridor.
- 38) The information submitted in response to application Part IV(7)(f) regarding pond 032 does not clearly indicate that the pond is a series structure consisting of two separate sections. In order to clarify this matter, the following information must be submitted:
  - (a) A discussion of relative timing of construction of the upstream structure (service road) and the downstream dam.
  - (b) A cross-section drawing of the upstream structure indicating elevations and details of the spillway.
  - (c) Calculations showing the capacity of the upstream spillway.

In order for pond 032 not to be considered an MSHA size structure [subject to Rule 1816.46(d)], the storage volume of Section A and of Section B must individually be smaller than 20 acre-feet at their respective emergency spillways.

- 39) In order to ensure compliance with Rule 1816.47, the drop inlet calculations on application page IV-52 used for spillway design of pond 032 must be revised. With 2 feet of head above the 30-inch riser, orifice flow conditions would exist instead of full flow.
- 40) The following modifications regarding sediment pond 034 must be made to ensure compliance with Rule 1816.47:
  - (a) The sediment pond table in application Part IV(7)(e) must be modified to accurately reflect the designs for ponds 034 and 035.
  - (b) The emergency spillway calculations for pond 034 must be revised. The 25-year storm volume must be considered when establishing the pipe size needed to serve as an emergency spillway.
  - (c) The planview and cross-section drawings show a 12-inch diameter pipe spillway; however, the sizing calculations indicate an 18-inch diameter pipe is required. The applicant must clarify the discrepancy.
- 41) The open channel spillways proposed in application Section IV(7)(j)(2) for incline outlet locations A and B are not compatible with the permanent access road to be located between the restored Bonnie Creek and the inclines. To assure compliance with Section 1816.150, the applicant must revise these spillway designs.



- 42) To assure compliance with Rule 1816.44(b), the Department will require the applicant to address the stability and capacity of the section of existing stream below the temporary Bonnie Creek relocation stilling pond. This stretch which flows under the railroad tracks and empties into the South Field Galum Creek diversion must be permitted if any modification will be made to it.
- 43) Additional mitigation of impacts upon wildlife habitat is necessary due to the loss of 81 acres of wildlife habitats (37 acres undeveloped, 44 acres forest). Pursuant to Section 1816.97, the applicant's post-mining land use plan must be modified by the addition of wildlife habitat or forest land uses in the two southern pasture areas. Furthermore, hedgerows intersecting cropland fields must be included in the post-mining land use plan.
- 44) Tall fescue is an incompatible cover crop on forest reclamation areas due to its competitive nature. Pursuant to Sections 1780.18(b)(5), 1780.29, and 1816.44(d)(1), the applicant must modify the herbaceous seed mixture for areas to be planted with trees or shrubs in order to aid attainment of the bond release requirements and ensure the long term survival of woody plant species.
- 45) Because fish and wildlife habitat is a proposed use of the final cut and incline impoundments, the operator must modify the application to provide enhancement of habitat in the proposed impoundments pursuant to Sections 1780.23(a)(1), 1816.49(a)(2), and 1816.49(a)(7). Maximum 5% grade incline and final cut sideslopes shall be graded a minimum of five feet below the final mean low water elevation of the impoundments.
- 46) The applicant failed to identify the precise location and configuration of the restored stream channel. Pursuant to Sections 1780.29, 1780.14(b)(6), and 1816.44(d)(2), the application must be modified by showing the location and configuration of restored Bonnie Creek.
- 47) The applicant failed to provide plans, maps, and drawings for riffles, pools, "floodplain potholes", and boulder deflectors. Pursuant to Sections 1780.29, 1780.14(b)(9), and 1816.44(d)(3), the application must be modified by inclusion of appropriate plans, cross-sections, maps or drawings for the proposed "floodplain potholes", and boulder deflectors. Furthermore, pursuant to Section 1816.44(d)(3), additional stream habitat structures shall be proposed for construction to enhance the diversity of the replaced stream such as current deflectors, check dams, and anchored brush shelters; appropriate locations, designs, maps and plans shall be submitted for each structure. All final designs and locations of such structures shall be approved by the Department of Mines and Minerals prior to installation.

- 48) Pursuant to Sections 1816.44(d)(2)&(3), the application shall be modified to show that the replaced stream channel's width shall not exceed 50 feet across the top of the banks.
- 49) The applicant shall modify the application to include a precise and thorough monitoring program for Bonnie Creek including examination of chemical, physical and biological characteristics. The monitoring results shall be submitted quarterly to the Illinois Department of Mines and Minerals by the following dates: March 1, June 1, September 1, and December 1. On the same dates quarterly progress reports on the permanent stream channel reconstruction shall be submitted including typical as-built cross-sections of the channel and floodplain and the locations and types of instream habitats.
- 50) In order to ensure compliance with Section 1816.44(a), Mines and Minerals approval will be required prior to the routing of Bonnie Creek through the temporary diversion.
- 51) In order to ensure compliance with Section 1816.44(a), Mines and Minerals approval will be required prior to the rerouting of Bonnie Creek through the permanent relocation channel. This approval will be made when the northern incline has filled to its final design level and the channel has been adequately stabilized as determined by the Department.
- 52) In order to ensure compliance with Section 1816.44(d)(2), the Department will require the applicant to follow the general design criteria listed below for meanders in the permanent restoration channel:
  - (a) Angle of Entry: The angle at which flow enters a bend (angle between the major flow line and the tangent to the bend) should be limited to 15° and must not exceed 25°.
  - (b) Radius of curvature: The ratio of the bend radius of curvature to the channel top width should be between 2 and 3.
- 53) The Department has determined pursuant to Rule 1816.44(d)(3) that a single cross-section for both the restored straight channel reaches and the meander bends is not appropriate. In addition to the typical restored channel cross-section submitted, the applicant must submit a typical bend cross-section configuration showing 3H:1V sideslopes on the inside of all bends. This section should have the same flow capacity as the proposed straightaway cross section.
- 54) In order to ensure that the application is accurate and complete as required by Rule 1786.19(a), Table 5D-3 must be relabeled as "depths" and Figure 5D-2 needs revision to show channel depth and to change bottom width from 20 feet to 10 feet.

- 55) Pursuant to Illinois Rules 1779.25(1), 1780.14(c), and 1780.25(a) and as required by Part I-10-C of the application, the Department is requiring the applicant to modify the application by submitting Engineering Certifications where the modifications result in changes to maps, plans, or cross-sections submitted under the original application.
- 56) Pursuant to Illinois Rule 1771.27 and as required by Part I-1 of the application, the Department is requiring the submittal of a notarized verification by a responsible official of the applicant for the information being submitted as a result of this modification letter.
- 57) Pursuant to 1780.25(c) and as required by Part V-11-B of the application, the Department is requiring the operator to modify the application to illustrate compliance with 1816.49(c). The company must supply the information necessary to show excavations that will permanently impound water will have perimeter slopes that are stable.

If you should have any questions, please feel free to contact this office at (217) 782-4970 or (618) 997-6391.

Sincerely,



Brad Evilsizer, Director  
Department of Mines and Minerals

BE:mc

cc: OSM  
A. Meyers  
J. Reising

## APPENDIX B

### CONSIDERATION OF COMMENTS AND OBJECTIONS

Section 1786.19(p) requires the Department to consider in writing comments filed by members of the Interagency Committee and County Boards. The following are comments received from the Interagency, County Board, and other members of the public and the Department's response to those comments.

#### Illinois Department of Agriculture

Comment - The permit application reports 11 residential or farm wells within one-half mile of the permit boundary. The applicant should address alternate water supply information per Section 1779.17. This may be of particular importance due to the reported replacement by the applicant of a diminished residential water supply in the vicinity of the north permit boundary of Burning Star #4.

Response - The Department found the comment to be valid. A modification has been required (see Appendix A, modification #31).

Comment - The permit applicant should use the required land use categories of Section 1701.5 for both pre-mining and post-mining comparisons of land uses.

Responses - The Department found the land use categories for pre-mining and post-mining acres adequate for review. No modification is necessary.

Comment - Under final correlation of the Perry County soil survey Hickory-Marseilles (913) has been recorrelated to Hickory-Wellston (900) and, as such, should be changed for all tables reflecting soil types in this application.

Response - The Department found the comment to be valid. A modification has been required (see Appendix A, modification #20).

Comment - Acreage figures for prime/high capability soil types do not appear to coincide with actual mapping unit acreage. This discrepancy should be addressed by the permit applicant.

Response - The Department found the comment to be valid. A modification has been required (see Appendix A, modifications #21 and #22).

Comment - The Department of Agriculture has observed that the reclaimed northern sections of Permits #118 and #152 will constitute several hundred acres of contiguous farm fields. In lieu of planting hedgerows to reduce the erosion potential, the applicant should utilize modern conservation tillage methods recommended by the local Soil and Water Conservation District.

Response - Comment has been forwarded to the applicant.

Illinois Environmental Protection Agency

Comment - The table on page IV-38 should be modified to accurately reflect the designs for ponds 034 and 035.

Response - The applicant is being required to modify the application to accurately reflect the designs for these ponds (see Appendix A, modification #40).

Comment - Since ditch "H" will be utilized during the entire life of this field and it is tributary to the temporary relocation, it is recommended that it be designed and constructed to pass a precipitation event with a 10-year recurrence interval.

Response - Ditch H is a temporary diversion which will probably not be utilized during the entire life of the mine. The applicant's design meets the requirements of Section 1816.43.

Comment - In the phase descriptions of the drainage control plan, more specific information regarding the elimination of drainage facilities in the existing North Field and subsequent development of facilities in the North Field/East should be provided. This should include a scheduling plan which includes pit advancement, ditch and relocation construction, pond construction, road closure, etc.

Response - The applicant has provided a scheduling plan for drainage control in front of the pit which is adequate to meet the requirements of 1780.21(b).

Comment - It appears ditch "A" may have more tributary than is shown in the designs. Also, more erosion control should be provided during construction of overland flow diversions particularly ditch "A".

Response - The applicant is being required to delineate the watershed boundaries of ditch A. The Department is also requiring the applicant to submit a spoil sloping plan for ditches A and H and to obtain specific approval from the Department before drainage can be directed through ditch A and H. This should ensure proper stabilization of these structures (see Appendix A, modifications #34 and #35).

Comment - Post-mining restoration and stream relocation activities will be occurring contemporaneously on much of this field and the existing North Field. The applicant has not demonstrated compliance with 1816.42 in areas under reclamation.

Response - The applicant has been required to submit a drainage control plan for areas under reclamation (see Appendix A, modification #36).

Comment - Since wells 4BS-51 and 4BS-53 are active water supplies, the applicant should identify an alternative source of water if necessary to replace the existing sources to comply with 1783.17.

Response - The Department found the comment to be valid. A modification has been required (see Appendix A, modification #31).

#### Illinois Department of Conservation

Comment - We have reviewed mining permit application #152, Burning Star #4 Mine, Consolidation Coal Company. Information supplied by Dr. McNerney, American Resources Group, Ltd., indicates that the archaeological mitigation process has been completed within the mining permit area. It is our opinion, therefore, that this project will have no adverse effect on archaeological resources.

Response - No response necessary.

Comment - Comparison of pre-mining and post-mining land use shows a net loss of 44 acres of forest and 37 acres of "undeveloped" land (i.e., wildlife habitat). Meanwhile, cropland will be replaced acre for acre. By changing the post-mining land use of the 2 southern "pasture" areas to high capability forest, this habitat loss would be averted without compromising the land's capability or economic value.

Response - The Department found the comment to be valid. A modification has been required (see Appendix A, modification #43).

Comment - By matching the Land Reclamation Map to that provided in Application #74, a major concern arises. Between the riparian corridors of the restored creeks (Galum and Bonnie) extend huge, uninterrupted east-west tracts of cropland. This expanse (over 1.5 miles adjacent to northernmost inclines) poses a potential for field erosion, particularly when exposed to prevailing westerly winds. To conserve soil and provide safe travel corridors for wildlife, a north-south fencerow should be planted along the approximate course of the old Jamestown Road (or along the drainage divide between the two streams). To assure compliance with 1816.97, the 50-75 foot wide fencerow should traverse the entire field (connecting all three inclines) and should consist of trees from the following species or others as approved by the Department: post oak, pin oak, hickories, Eastern red cedar, gray dogwood, wild black cherry, mulberry, persimmon, sumac, and hawthorn.

Response - The Department found the comment to be valid. A modification has been required (see Appendix A, modification #13).

Comment - In accordance with 1816.112, the applicant should delete autumn olive and the three non-native pines from their planting lists. These species exhibit undesirable spreading tendencies and may outcompete native species.

Response - The Department found the comment to be valid. A modification has been requested (see Appendix A, modification #32 and finding at Part III, Section A, 1786.19(n), 1816.112).

Comment - Eastern red cedar may be substituted for pines while the following bottomland hardwood species, presently found on the Bonnie Creek floodplain, should be added to the riparian planting list: swamp white oak, paw-paw, box elder, hackberry, sassafras, persimmon, and buttonbush.

Response - The comment has been forwarded to the applicant.

Comment - Tall fescue should be omitted from the herbaceous cover mix preceding forest plantings as it is highly competitive with tree and shrub seedlings. To aid compliance with the revegetation standards of 1816.117, timothy and/or red top may be substituted for fescue. For the same reason, Korean lespedeza should be substituted for sericea lespedeza in the riparian and bank seedings. Total seeding rate of these cover mixes should be reduced to 25 lbs. per acre to enhance the survival of woody seedlings.

Response - The comment has been forwarded to the applicant.

Comment - Incline and final cut profiles clearly show angle-of-repose slopes below the anticipated water level. Since fisheries is proposed as a post-mining use of these impoundments, a shallow spawning zone would assure the suitability for this intended use as required by 1816.49(a)(7). Side-slopes should be graded to no greater than 50% for at least 5 feet below the 440-foot mean water level.

Response - The Department found the comment to be valid. A modification has been required (see Appendix A, modification #45).

Comment - The federally endangered Indiana bat (Myotis solidalis) is known to occur in the region. Based on habitat preferences and a field inspection of the proposed permit area, we anticipate that the proposed operation may affect the Indiana bat. The state threatened loggerhead shrike (Lanius ludovicianus) was observed on the permit area in January and June of 1984. Based on known distribution and habitat preferences, the following state endangered (SE) and state threatened (ST) species may also occur on the proposed permit area:

Animals

- SE - Barn owl (Tyto alba)
- SE - Short-eared owl (Asio flammeus)
- ST - Golden mouse (Ochrotomys nuttalli)

Plants

- SE - Sedge (Carex australis)
- SE - Bead grass (Paspalum dissectum)
- SE - Small wild carrot (Daucus pusillus)
- ST - Grass-leaved lily (Stenanthium gramineum)
- ST - Golden seal (Hydrastis canadensis)

One additional ST mammal species has been known to occur in Perry County but, based on habitat preferences, there is a minimal probability of occurrence in the proposed permit area.

Response - Comment has been forwarded to the applicant.

Comment - The proposal to route the permanent Bonnie Creek channel through "low areas running parallel to the spoil" could result in a series of straight channel reaches connected by excessively sharp meanders. Such a configuration would lead to extreme flow velocities in the straightaways and severe bank failure at meander bends. A natural, sinuous pattern will best assure stability of the new channel. Therefore, the reconstructed channel should be designed without long, straight reaches and with gradual meander bends (angle of entry not to exceed 25°) regardless of the spoil placement.

Response - The Department found the comment to be valid. A modification has been required (see Appendix A, modification #52).

Comment - Likewise, routing the channel through "naturally occurring depressions in the spoil" raises the possibility of losing the channel in a wide, shallow expanse of stagnant water. This does not constitute a "pool" but rather a marsh. While such wetlands are otherwise quite beneficial to a reclamation plan, they would greatly hamper the recovery of Bonnie Creek's aquatic community if located within the actual stream course. If the operator is to utilize spoil depressions, the proposed channel cross-section (i.e., 8-foot banks) should still be maintained. Also, the reconstructed channel's width should at no point exceed 60 feet across the top of its banks.

Response - The Department found the comment to be valid. A modification has been required (see Appendix A, modifications #53 and #48).

Comment - Depressions proposed as wetlands adjacent to the natural channel should not impound water at the expense of Bonnie Creek's base flow. Any such depressions must be above the elevation of the stream's mean flow level and should drain freely into the channel. During high spring flows, such "potholes" could hold water and provide seasonal breeding habitat for waterfowl and other forms of wildlife. Later in the year, however, the maintenance of instream flow becomes critical to the stream community. Therefore, any nearby depressions should drain into the stream rather than impound water at a lower elevation.

Response - Comment forwarded to the applicant.

Comment - The gently sloping 2:1 banks proposed for the permanent channel are appropriate given the erosive potential of the spoil material. Bank slopes, however, should approach 3:1 (horizontal:vertical) on the convex (inside) banks of all meander bends. This will closer approximate natural conditions whereby the inside banks of meanders become areas of deposition and develop point bars.



Response - The Department found the comment to be valid. A modification has been required (see Appendix A, modification #53).

Comment - Consol's proposal to provide boulder deflectors as instream habitat is commendable; such measures have proven successful in similar stream restoration projects. Indiscriminate use of boulders, however, can lead to problems such as the snagging of debris and the deflection of flow into unstable banks. Through our role in the Interagency Stream Diversion Subcommittee, the Department will advise the operator on the sizing and location of these boulders along with any protective measures associated with their placement.

Response - Comment has been forwarded to the applicant.

Comment - The operator should supplement their boulder deflectors with additional structures to simulate natural flow characteristics and help mitigate the loss of woody debris which presently comprises most of Bonnie Creek's instream habitat. Several structures can be constructed using the lumber obtained from pre-mining logging operations. Among these are log-frame current deflectors, check dams, and anchored brush shelters. Again, the Department will assist Consol in the careful design and location of such structures. The exact number and variety of habitat improvement devices will depend upon the final layout of the channel and a consideration of the operator's logistic and economic limitations.

Response - The Department found the comment valid. A modification has been required (see Appendix A, modification #47).

Comment - Artificial riffles will add to the substrate diversity of the restored channel provided they are properly located and held in place. Gravelly riffles presently occur in the straighter, higher gradient reaches of Bonnie Creek. Artificial riffles should approximate these locations in the reconstructed stream channel. Final quantity and design of these riffles will be discussed with the operator.

Response - Comment has been forwarded to the applicant.

Comment - Although the primary source of bank stability should be a complete vegetative cover of the channel's sideslopes, localized areas of scour (including those associated with flow deflectors) may require additional armoring. Rock riprap should be available to protect such areas as the need arises. Riprap should always be underlain with a filter layer of crushed stone and grouting should be avoided whenever possible. Sizing of the riprap material should be done in anticipation of extreme flow velocities; material should not be any larger than what is needed for stabilization.

Response - Comment has been forwarded to the applicant.

Comment - The applicant is requested to initiate a thorough monitoring of Bonnie Creek's physical, chemical, and biological condition beginning with the natural channel and continuing through the temporary and permanent phases of relocation. The details of this study, including data needs, frequency of sampling and location of sampling sites will be covered in future meetings between Consol and the Interagency Stream Diversion Subcommittee.

Response - Comment has been forwarded to the applicant.

USDA Soil Conservation Service

Comment - The soil permeability chart on page 47, Part IV, Volume I, should have the following corrections:

- A. 214B and 214C3 should have a subsoil permeability of less than 0.06 in./hr. in the lower part. It is currently listed on the chart as 0.6 to 2.0 in./hr. throughout the subsoil.
- B. 787 should have a permeability in the surface of 0.2 to 0.6 in./hr., and 0.06 to 0.2 in./hr. in the subsoil. It is currently listed on the chart as 0.2 to 2.0 in./hr. throughout.

Response - This comment has been forwarded to the applicant.

Comment - During final correlation of the Perry County, IL, Soil Survey in January, 1984, hickory-marseilles (913) was correlated to hickory-wellston (900).

Response - The Department found the comment to be valid. A modification has been required (see Appendix A, modification #20).

Comment - The seeding mixture of tall fescue at the rate of 30 lbs./ac., and alfalfa at the rate of 10 lbs./ac. would be more suitable for critical area planting than the mixture of alfalfa, tall fescue, red clover, and orchard grass at 10 lbs./ac., 12 lbs./ac., 4 lbs./ac., and 6 lbs./ac., respectively. If dormant seeding is used, increase seeding mixture by 50%. Information on pasture and hayland planting, critical area planting, seeding mixture, mulching, and land smoothing can be found in Section IV of the USDA, Soil Conservation Service Technical Guide.

Response - The comment has been forwarded to the applicant.

## APPENDIX C

Consolidation Coal Company, Burning Star No. 4 Mine, Appl. 152

### Assesment and Findings of Probable Cumulative Hydrologic Impacts

As required under Federal P.L. 95-87, Section 510(b)(3) and Illinois PA 81-1015 2.08(b)(c), the Department must find in writing that the following proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. This requirement is again stated in Illinois Rule 1786.19(c) as a criteria for permit approval or denial.

The applicant must submit in writing a determination of probable hydrologic consequences of the mining and reclamation operations, both on and off the permit area so that an assessment can be made by the Regulatory Authority of the probable cumulative impacts of all anticipated mining upon the hydrology and water availability in the area, as stated in P.L. 95-87, Section 507(b)(11).

The following assessment and findings are intended to fulfill the above mentioned rules and regulations.

#### I. Assessment.

Cumulative Hydrologic Impact Area. The proposed permit area lies within the watershed of Galum Creek. This watershed has been mined extensively in the past by primarily, three separate mines. Uppermost in the watershed are the workings of the Consolidation Coal Burning Star No. 4 Mine. Immediately downstream of this operation are the active pits of the Arch of Illinois Captain Mine. Then, immediately downstream are the operations of the Leahy Mine, recently purchased by Arch of Illinois from Amax. These operations total approximately 19,600 acres which either are, or are pending, under permanent program applications.

The Galum Creek system consists of several smaller tributaries which have been affected by mining to various degrees. Little Galum and Brushy Fork Creeks have been affected the least by previous operations. In the future, it is likely that the watershed of Little Galum Creek will be affected further. Pipestone Creek has been diverted along almost all of its entire length by operations at the Captain and Leahy Mine. And, Bonnie Creek is proposed to be diverted by operations in the Consolidation Coal Burning Star 4 North field, which has also diverted the upper portion of Galum Creek. All of these diversions are temporary and the streams will be returned to their reclaimed channels during reclamation.

The nearest U.S.G.S. point, downstream of all of the previously mentioned mining activity is point number 05599100 (U.S.G.S., 1980). This point is approximately one and one-half miles downstream of the convergence of all of the previously mentioned tributaries. At this point, the total drainage area is 162 square miles, or approximately 103,680 acres. The total acreage under permanent program permits, or pending, (19,600 acres) comprises approximately 19% of the total watershed. This figure is expected to increase as additional acreage is permitted in the future. Downstream of the

previously mentioned U.S.G.S. point, Galum Creek converges with Beaucoup Creek, which also has been affected by mining. In fact, Galum Creek does not converge with any other streams of equal or greater magnitude that have not been affected by mining operations. Therefore, for the purposes of this assessment and findings, the cumulative hydrologic impact area is assumed to be the watershed of Galum Creek, at the point of convergence with Pipestone Creek.

Surface water. The permanent program operations at the Consolidation Coal Burning Star No. 4 Mine consist of tippable operations and active mining of the Harrisburg-Springfield (No. 5) and Herrin (No. 6) Coals in the North Field. Additionally, an experimental practices proposal is pending for a slurry impoundment. In pre-mining conditions, the amount of developed water resources amounted to 30.1 acres, primarily as small isolated ponds and lakes. In post-mining conditions, the amount of developed water resources is estimated to be 282.8 acres by the applicant. The majority of the change will occur in the permit areas 74 and 152, which are the active mining areas. The increase will come about as a result of flooded inclines and final cuts. The increased water acreage will account for approximately 4.8% of the total land use in post-mining conditions, whereas water was only 0.5% in pre-mining conditions.

In addition to the change in actual surface water acreages, there will also be other impacts to surface water flow which should also be considered. The addition of these large impoundments will serve to lower peak flows off of the permit areas in post-mining conditions because of the increased retention times afforded by these new impoundments. Also, this will also result in increased baseflow to area streams during, otherwise, dry periods. These same characteristics were also documented by Corbett (1965) for heavily mined areas of southwest Indiana.

Surface water quality of the proposed permit and adjacent area has been collected by the applicant. The area proposed under application number 152 is drained mainly by Bonnie Creek and to a lesser extent by the main tributary of Galum Creek. Water data was presented by the applicant for several points. Data for three of those points are summarized below in Table 1. Points G-1 and B-1 are points upstream of any mining on Galum and Bonnie Creeks, respectively. Point G-3 is below the confluence of these streams and at the downstream-most point of the permit area.

Table 1. Ambient surface water quality data, Galum and Bonnie Creeks

	<u>Sta. G-1</u>			<u>Sta. B-1</u>			<u>Sta. G-3</u>		
	<u>Max</u>	<u>Min</u>	<u>Ave</u>	<u>Max</u>	<u>Min</u>	<u>Ave</u>	<u>Max</u>	<u>Min</u>	<u>Ave</u>
pH	7.6	6.6	-	7.5	6.9	-	8.1	6.9	-
TDS	528	96.1	449	537	251	387	2420	830	1520
TSS	93	11	88	124	36	70	119	36	91
Alk	206	86	139	106	82	93	242	114	172
Ac	0	0	-	0	0	-	0	0	-
Fe	2.5	1.3	2.1	3.1	1.6	2.1	2.7	0.5	2.3
Mn	2.4	0.33	0.82	1.1	0.08	0.59	0.71	0.01	0.28

Examination of this data shows that there have been only relatively minor changes to surface water quality as a result of previous mining activities. The pH has shown an increase in the maximum observed value. This could possibly be due to the alkaline nature of the overburden present in the proposed permit and adjacent area. This could also be the reason for the increases observed in alkalinity as well. All stations reported high alkalinity with no measurable acidity. Total suspended solids and iron stayed relatively unchanged after flowing across the permit areas and manganese showed a slight decrease. The only other change which showed any appreciable change, other than pH, was total dissolved solids (TDS). Maximum, minimum and average values were all much higher downstream than upstream. One of the major constituent of the TDS are sulfates which are created by the oxidation of, primarily, pyrite. However, because of the alkaline nature of the overburden, all acid is immediately neutralized and no free acidity is created. However, even though TDS has increased, it is not at such levels that would preclude the use of the water to support post-mining land uses. The existence of several adjacent final cuts with satisfactory quality further proves this point (Gibb and Evans, 1978).

During the active operations, the applicant will be required at all times to comply with all applicable State and Federal effluent standards. Adherence to these standards should prevent adverse impacts to surface water quality as a result of these operations.

Ground water. Ground water conditions within the permit and adjacent area have been described by several sources. Pryor (1956) described the ground water geology of southern Illinois on a county by county basis. For this part of Perry County, he stated that reliable supplies may be obtained at depths of 500 to 600 feet from lower Pennsylvanian sandstones sufficient for small municipal or industrial needs. Shallow ground water conditions were described as much less favorable with only small supplies available from scattered and discontinuous sands in the unconsolidated overburden. Woeller (1975) described the public ground water supplies for Perry County. Several nearby public supplies developed from the Caseyville Formation were described. Additionally, the active mines in this area have also completed wells into the same interval for their own use. Zuehls, et al., (1981) have also described the ground water conditions and have arrived at the same conclusions as Pryor. That being, small municipal supplies from basal Pennsylvanian sandstones, and small domestic or agricultural supplies from the unconsolidated materials.

Operations in and near the active pit will have some impact on the local ground water system. During active operations ground water will flow from unmined areas into the active pit. This will create a cone of depression of the water table around the active pit extending out into unmined areas. For these types of geologic materials in this area, the distance out to which this depression will extend should be limited to less than 1000 feet. Studies in this area by Oertel (1980) have demonstrated a limited extent for water table depression. Cartwright and Hunt (1981) have also suggested a limited extent for impacts in this area. This dewatering of adjacent areas is expected to occur only during active mining. When the operation is completed, the water table will begin to recover will stabilize at, or near the pre-mining levels. The existence of several filled final cuts and

inclines in the immediate area is further support of this fact. To assure that these proposed operations do not adversely impact adjacent water users, the applicant has proposed to install an additional monitoring well to be located directly between the nearest private water well and the active operation. This will allow the applicant to detect any adverse impacts to adjacent water users in sufficient time to take any necessary mitigating action.

Impacts to ground water quality should be similar to those seen in surface water, mainly increases in total dissolved solids. In certain areas within the permit area, the applicant will dispose of coarse processing refuse material. The net neutralization potential of this material was measured at -220 tons calcium carbonate per 1000 tons of material which is sufficient to classify the material as potentially acid producing (West Virginia, 1974). However, studies by Infanger and Hood (1980) and Hoving and Hood (1984) have demonstrated that for even very acidic material, so long as it is covered in a timely manner with alkaline material, acid generation will not present a problem. Analysis of the overburden by the applicant has shown that it is very alkaline which will aid in the control of acid generation.

To monitor both the refuse disposal areas and any adjacent private wells, the applicant has currently three wells in the active mining area. For the new area, the applicant has added a fourth well. The monitoring program of the applicant has thus been designed so that if any unanticipated adverse impacts do occur, they should be detected in sufficient time to take any necessary mitigating measures.

## II. Findings.

Surface water. The proposed operations of this mine will increase available surface water from 30.1 to 282.8 acres. This added surface water will aid in the support of post-mining land uses as well as decrease peak flows off of the permit area and increase base flows to the receiving streams.

Surface water quality of the receiving stream was documented by the applicant. Certain changes to surface water quality may be expected, such as increases to total dissolved solids. However, these changes to water quality should not preclude the use of the water to support the post-mining land uses.

Ground water. Ground water conditions in and adjacent to the proposed permit area were documented by the applicant. Impacts to adjacent water levels should be limited to within 1000 feet of the active pit and water levels should reestablish themselves to at or near premining levels when mining and reclamation is complete.

Ground water quality will experience much the same impacts as surface water impacts, that is increases in total dissolved solids. Adverse impacts as a result of processing refuse disposal should not occur so long as the approved plan for refuse disposal is followed. The applicant's ground water monitoring plan has been designed so that if any adverse im-

pact do occur, there will be sufficient time to take necessary mitigating action.

In summary, the assessment and findings of the probable cumulative impact of all anticipated mining in the area on the hydrologic balance finds that the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

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- Woeller, D. M., 1975, Public Ground Water Supplies in Perry County: Illinois. State Geological Survey Bulletin 60-13, 5 p.



## APPENDIX D

### DECISION ON PROPOSED POST-MINING LAND USE/CAPABILITY OF PERMIT AREA

The pre-mining and approved post-mining land uses of the permit area are as follow:

	<u>Pre-Mining (Ac.)</u>	<u>Post-Mining (Ac.)</u>
Cropland	1,306.9	1,306.9
Pastureland	145.4	22.0
Forestry	432.9	221.8
Residential	50.6	16.9
Industrial (public road)	31.9	11.2
Developed Water Resources	38.9	186.9
Undeveloped Land	37.4	0.3
Wildlife Habitat (Riparian Forest)	0.0	278.0
TOTAL	<u>2,044.0</u>	<u>2,044.0</u>

This represents a 66.9-acre increase in forestry acres, and a 148-acre increase in developed water resources. There is a 123.4-acre decrease of pasture acres, a 33.7-acre decrease of residential area, a 20.7-acre decrease of industrial (roads) acres and a 37.1-acre decrease in undeveloped land. The increase of forest is considered to be a higher or better land use for this field. The mining in this field will result in a final cut. The forest is associated with the Bonnie Creek restoration and the final cut slopes. This increase of forest will provide wildlife habitat areas that were previously destroyed due to past mining in other areas. Also as a result of the final cut, developed water resource acres increased.

The decrease of acres in industrial (road) acres and residential acres is due to the mining process itself. These types of pre-mining acres are expected to decline. The decline of pastureland, however, is due to the fact that a final cut lake will result in this field. However, these lost pasture acres are made up by equal or better land uses in the post-mining plan.

The Department considers permitted areas to fall into three general capability groups -- prime farmland, high capability and non-cropland capability. Prior to mining, the prime farmland classification contains all prime farmland soil types as defined by Rule 1701.5. High capability classification contains all soil types with Capability Classes I, II, III and those soils in Capability Class IV with slopes 5% or less.

Prime farmland soils that are grandfathered or which receive a negative determination are reclaimed to high capability standards.

The non-cropland capability classification contains all soils which do not qualify as prime farmland or high capability and all other areas such as road, water, industrial areas, residential areas, etc.

Post-mining, the prime farmland classification contains all lands reclaimed to prime farmland standards set forth in 1823, if applicable. High capability classification consists of all lands reclaimed in accordance with 1825. Non-cropland capability classification contains all areas reclaimed to standards other than prime farmland or high capability.

The pre-mining capability of the land in the proposed permit area is:

Prime Farmland	1,268.4
High Capability	242.3
Non-Cropland Capability	<u>533.3</u>
Total	2,044.0

The applicant has proposed to return the land to the following post-mining land capability:

Prime Farmland	73.4
High Capability	1,437.3
Non-Cropland Capability	<u>533.3</u>
Total	2,044.0

This represents a 1,195.0 acre decrease of prime farmland acres. However, 1,094.0 acres of the pre-mining prime farmland were approved for "Grandfathering" under Opinion and Order 83-3. (See Appendix G). Another 101.0 acres of pre-mining prime farmland qualified for a negative determination due to those acres not being historically used for cropland. See the finding at Part III, Section A, 1786.19(1) for a discussion of prime farmland. This total acreage of 1,195.0 acres of prime farmland grandfathered and negatively determined will be reclaimed to high capability standards.

Those acres previously disturbed by roads, water, home and farmsteads that were included in prime farmland and high capability acreage figures have been subtracted and included in non-cropland capability acreage totals. The applicant is providing all available prime farmland and high capability acreage.

The post-mining land use/capability will be in accordance with the requirements of Section 1816.133.

The Department thus finds the land areas affected by surface coal mining activities will be restored in a timely manner to conditions that are capable of supporting the use which they were capable of supporting before any mining or to higher or better use achievable under the criteria and procedures of Section 1816.133. The plan of restoration submitted by Consol does not present any actual or probable hazard to public health or safety [see discussion at Part III, Section A, 1786.19(n) and 1816.49(a)(1)-(7) of the finding], nor does it pose any actual threat of water diminution or pollution and the proposed land use following is not impracticable or unreasonable. The land uses are not inconsistent with any applicable land use policy or plan. The land uses plan does not involve unreasonable delay in implementation and is not known to be in violation of any other applicable law.

The plan does not pose any actual threat of water diminution or pollution as indicated in Appendix C. The proposed land uses following mining are not impracticable or unreasonable as all the post-mining uses existed prior to mining and are found in the surrounding adjacent area. The land uses are not inconsistent with any applicable land use policy or plan as there

are no such policies or plans and no objections were heard from any governmental agency with such authority. The land use plan does not involve unreasonable delay in implementation, particularly if the plan as proposed is followed. The land use plan is not in violation of any other applicable law known to the Department.

The Department also finds that all soils with a capability class of I, II, III and capability class IV with slopes 5% or less are capable of being reclaimed for rowcrop agricultural purposes based on U.S. Soil Conservation Service soil survey classifications of the affected land prior to mining as set out in the application. The Department further finds the optimum future use of these soils is rowcrop agricultural purposes.

## APPENDIX E

### PRIME FARMLAND IMPACT ASSESSMENT

Consolidation Coal Company  
Burning Star #4 Mine - Application #152  
Perry County

The prime farmlands within the permit area which are going to be mined include:

<u>Series</u>	<u>Number</u>	<u>Slope</u>	<u>PI*-HLM</u>	<u>Taxanomic Classification</u>	<u>Univ. of Ill. Prime Class*</u>
Cisne	2	A	115	Mollic Albaqualf	C
Belknap	382	A	120	Aeric Fluvaquent	C
Bonnie	108	A	110	Typic Fluvaquent	C
Hoyleton	3	B	114	Aquollic Hapludalf	C
Hosmer	214	B	114	Typic Fragiudalf	C
Stoy	164	A	115	Aquic Hapludalf	C
Stoy	164	B	114	Aquic Hapludalf	C
Stoy	164	B <sub>2</sub>	110	Aquic Hapludalf	C

The prime series in the permit area are in three soil associations.\*\* The predominant association is P, the Hosmer-Stoy-Weir Association, which is common in Southern Illinois. These soils are light-colored, strongly developed soils formed under forest vegetation from loess 4-10 feet thick on Illinois glacial till or more than 7-foot loess on bedrock. Hosmer is moderately well-drained, Stoy is somewhat poorly drained, and Weir is poorly drained. These soils have silt loam A horizons and silty clay loam B horizons. Only the Hosmer has a fragipan which is weakly to moderately developed.

The second association is Z, which consists of the bottomland soils Bonnie and Belknap. Belknap and Bonnie are weakly to not developed soils formed from alluvial material deposited in low-lying areas under forest vegetation.

Belknap is somewhat poorly drained, with Bonnie being poorly drained. These soils have silt loam A horizons and silt loam subsoils.

Cisne and Hoyleton are included in Soil Association F\*\*. These moderately dark-colored alfisols developed under grass vegetation. These strongly developed soils have silt loam A horizons and heavy silty clay loam B horizons. Hoyleton is somewhat poorly drained and Cisne is poorly drained. Native fertility is low.

Specific discussions or information can be obtained from SCS established interpretation sheets, SCS established "Blue Sheets", University of Illinois Agricultural Experiment Station Bulletin 725\*\*, and Circular 1156\*, which are used as references to evaluate the soils.

The operator proposes to mix the B and C horizons. This will be done primarily with scrapers and trucks.

The predominant prime soil is Stoy (75% of the area), a claypan soil. Hosmer, a fragipan soil, is 11% of the prime area. The pH of the B/C mix will improve greatly to near optimum levels. Available and reserve phosphorus will be reduced slightly whereas potassium will be improved slightly. Textures will average a 2% drop in clay content, changing the texture class from silty clay loam to clay loam. As the texture will only change slightly, the pH improvement is considered a dominant factor in assessing the mixture to be equal to that of the pre-mining B horizon.

In light of the information submitted by the applicant, the reference soil information, my experience on soils and reclamation, other productivity information gathered by the Department, the comments of other reviewing agencies and recognized experts, I believe the applicant has the technological capability to restore these prime farmlands to equivalent productive potential within a reasonable period of time.

Dean Spindler, CPSS

## APPENDIX F

### FINDING ON THE OPERATOR'S TECHNOLOGICAL CAPABILITY TO RESTORE PRIME FARMLAND

The original permit application and subsequent modification of the application addressed the requirements of Section 1785.17. Pursuant to Section 1785.17(b), the applicant submitted detailed plans for the mining and restoration of the prime farmlands affected by surface mining activities.

1785.17(b)(1) Subject to Section 1785.17(b)(1), the applicant has submitted a soil survey of the permit area which meets the standards of the National Cooperative Soil Survey. The results of test borings which showed representative soil profiles for the prime farmland soil were also submitted.

1785.17(b)(2) The proposed method and type of equipment to be used for removal, storage, and replacement of the soils were described pursuant to Sections 1785.17(b)(2) and 1823.12. The A horizon will be removed with dozers and scrapers. The B and C horizons will be removed with the dragline or scraper and trucks. Replacement will be with the same equipment. Historically, scrapers and trucks are needed as the dragline has not been able to selectively handle the B/C horizons without contamination.

1786.17(b)(3) Stockpile locations were shown on the Mining Operations Map; plans for identifying the prime soils, and plans for soil stabilization before redistribution were submitted in conformance with 1785.17(b)(3). Stockpile stabilization will occur by establishment of a vegetative cover and mulch; these measures will minimize erosion. The prime topsoils will be mixed with the non-prime due to similar texture.

1785.17(b)(4) and 1785.17(b)(6) Documents were reviewed supporting the use of a B-C horizon mixture in place of the original B horizon, to obtain on the restored area equivalent or higher levels of yield as non-mined farmlands. The applicant submitted an extensive bibliography of available agricultural studies conducted by universities, company research and other scientific data. This information supported the applicant's belief that the proposed methods of reclamation will achieve, after a reasonable time, equivalent or higher levels of yield after mining as existed prior to mining.

1

Dean Spindler, "Three Case Studies on Rowcrop Production on Mined Land" prepared for the Symposium on Surface Mining Hydrology, Sedimentation and Reclamation, University of Kentucky, Lexington, KY, December 7-11.

Donald E. McCormack, "Soil Reconstruction: For the Best Results After Mining" prepared for the Coal and the Environmental Technical Conference, Louisville, KY, October 22-24, 1974.

Snarski, R.R., J.B. Fehrenbacher, I. Jansen, 1981, "Physical and Chemical Characteristics of Pre-mine Soils and Post-mine Soil Mixtures in Illinois", SSSA Jour., V45, #4.

McSweeney, I. Jansen and W.S. Dancer, 1981, "Subsurface Horizon Blending: An Alternative Strategy to B Horizon Replacement for Construction of Post-Mine Soils", SSSA Jour., V 45, #4.

Grandt, Alten F., 1981, "Problems in Reclaiming Farmland in Illinois", Mining Eng., September 1981, p. 1347-1351.

In addition to relying on the above data, the Department has relied on the expertise of its Land Reclamation Division. Based on this evidence, the Department considers it quite probable that the applicant will meet bond release requirements on the prime farmland areas which will be mined and reclaimed.

1785.17(b)(5) Plans for proper seeding, cropping, and erosion control structures on reclaimed prime farmland were adequately addressed in the application in accordance with Section 1785.17(b)(5). After topsoil replacement, prime farmland soils will undergo seedbed preparation through the use of conventional farm equipment. The initial seed mixture per acre will be 12 lbs. of fescue, 10 lbs. of alfalfa, 6 lbs. of orchard grass, and 6 lbs. of red clover. Cover crops will be wheat, oats, or sorghum sudan grass alone or in combination. The pasture vegetation will be replaced by rowcrops as specified by the Department.

Erosion control will be accomplished by proper seeding, fertilization and mulching, which will encourage prompt growth of vegetation. The area will be graded to approximate original contour. Planned erosion control systems will be implemented when erosion rates exceed the SCS tolerable soil loss limits.

1785.17(b)(6) The data considered by the Department under Section 1785.17(b)(4) is also applicable to Section 1785.17(b)(6).

1786.17(b)(7) Yield data was not submitted for each unmined soil map unit for each commonly grown crop on the prime farmland. In order to satisfy the requirements of Section 1785.17(b)(7), the Department consulted the productivity indices for each of the soil types on the permit area in "Soil Productivity in Illinois", University of Illinois, Cooperative Extension Service, Circular 1156.

The Department has determined the soil productivity after mining will be returned to equivalent levels of yield as non-mined prime farmlands of the same soil type in the surrounding area under equivalent management practices, as discussed hereafter.

The soil parameters analyzed were those requested by the Department. The projected physical and chemical qualities of the B and C horizons mixture were determined by using weighted averages of the various properties of the B and C horizons of the core samples. A total of 26 core samples under the prime farmland soils were submitted and 21 deep samples of B and C horizons. The Department has determined that an adequate number of core samples was submitted to obtain a representative sample of the prime farmland soil types to be mined. Analysis for phosphorus, potassium, pH, and texture were performed at various incremental depths.

The data, information and analyses submitted indicate that the B and C mixture should be equal to or better than the unmined B horizon. The applicant has proposed to mix the B and C horizon by using the dragline; however, the primary system will be scrapers and trucks. Comparison of the analyses of the B horizon core samples and the proposed B and C mixture show that the pH of the proposed mixture will increase significantly, from as low as 4.1 to a post-mining projected pH of 5.4-6.2 which will be slightly less than the optimal pH range. The pH may be higher if deeper till material is placed near the surface. The pH will probably drop over time from the use of ammonium fertilizer. The P<sub>1</sub> and the P<sub>2</sub> of the proposed mix will be slightly decreased over the pre-mining soils. Potassium in the mixture is projected to be slightly higher.

The proposed texture will average about 2% less clay and will change texture classes from silty clay loam to clay loam. Clay and fragipans will be removed, however.

The Federal Act specifically requires in Section 510(d)(1) that two findings be made by the Regulatory Authority in granting a permit to mine on prime farmland; the Department regulations at Section 1786.19(1) also require a prime farmland finding. Section 510(d)(1) states:

"In addition to finding the application in compliance with subsection (6) of this section, if the area proposed to be mined contains prime farmland pursuant to Section 507(b)(16), the Regulatory Authority shall, after consultation with the Secretary of Agriculture, and pursuant to regulations issued hereunder by the Secretary of Interior with the concurrence of the Secretary of Agriculture, grant a permit to mine on prime farmland if the Regulatory Authority finds in writing that the operator has the technological capability to restore such mined area, within a reasonable time, to equivalent or higher levels of yield as non-mined prime farmland in the surrounding area under equivalent levels of management and can meet the soil reconstruction standards in Section 515(b)(7). Except for compliance with subsection (b), requirements of this paragraph (1) shall apply to all permits issued after the date of enactment of this Act."

The first requirement concerns the operator's technological capability to restore the mined area, within a reasonable time, to equivalent or higher levels of yield as non-mined prime farmland in the surrounding area under equivalent levels of management. The Regulatory Authority has reviewed other data not submitted by the operator which supports the Regulatory Authority's finding. (Anon. "The ultimate in double-cropping - from coal mine to crops," Successful Farming, Feb. 1979:16; Personal Communication from J.R. Deutsch, Environ. Sci., Public Serv. Comm., N.D., to D. Spindler, Soil Scientist, Division of Land Reclamation, Illinois Department of Mines and Minerals, dated 2-15-79; Transcript of Proceedings of hearing before the Illinois Department of Mines and Minerals, Application by AMAX Coal Company, Sun Spot Mine, Ipava Area, 12/17/75, Lewistown, Illinois.) The Regulatory Authority has also reviewed the information submitted by the applicant in support of its proposed restoration plan. These documents are available for inspection at the Land Reclamation Division Office in Springfield.



1785.17(b)(8) After reviewing all documents submitted by the applicant and all other data referenced herein, the Regulatory Authority has determined that the operator has indicated the requisite technological capability to restore the mined area, within a reasonable time, to equivalent or higher levels of yield as non-mined farmland in the surrounding area under equivalent levels of management in accordance with Section 1785.17(b)(8).

The second requirement of Section 510(d)(1) concerns the soil reconstruction standards in Section 515(b)(7). The Regulatory Authority has reviewed the application concerning the operator's plan to comply with these requirements and find it complies with Section 515(b)(7) of the Federal Act and Sections 1785.17 and 1823 of the Department's regulations.

1785.17(c) The Regulatory Authority has consulted with the Soil Conservation Service, designated representative of the Secretary of Agriculture. The Department's consideration of the U.S. Soil Conservation Service comments are addressed in Appendix B. Some pre-mining permeability data was incorrectly submitted by the applicant. The applicant was informed the information provided by the SCS was considered in the prime farmland plan evaluation.

1785.17(d)(1) The approved post-mine land use of the reclaimed prime farmlands will be cropland pursuant to Section 1785.17(d)(1).

1785.17(d)(2) The Department has considered the comments of the representative of the U.S. Secretary of Agriculture (S.C.S.).

1785.17(d)(3) As previously discussed, the Department believes the applicant has the technological capability to restore prime farmland, within a reasonable time, to equivalent or higher levels of yields as non-mined prime farmland pursuant to Section 1785.17(d)(3).

1785.17(d)(4) The special requirements for prime farmland restoration of Section 1823 have been addressed below in accordance with Section 1785.17(d)(4). Some of the subsections in Section 1823 have been previously addressed by 1785.17 discussions. Only those items not previously discussed will be below.

1823.11(a) The applicant has submitted the required information and documentation to obtain a permit to mine on prime farmland in accordance with Section 1823.11(a).

1823.14(a)(2) This section is applicable to the Hosmer series, a fragipan soil. It may be reclaimed to the standards of 1825.14(a)(1),(2),(3) for soil reconstruction. This is essentially a B/C mixture. The B horizon of the soil contains a restrictive layer, the fragipan which inhibits but does not prohibit root penetration. The B horizon also contains other detrimental factors such as low pH. In these type soils, a mixture with the underlying C horizon will result in a chemically and structurally equal or superior subsoil.

1823.14(b) Topsoil will be replaced after the root medium replacement and will be protected by a nurse crop until a permanent cover planting season when it will be replanted.

1823.14(c) Compaction will be minimized by handling the soil during dry weather, and the Department will require a compaction alleviation plan if it is determined that excessive compaction is causing low yields.

1823.14(f) The applicant has made a commitment for refertilization based on soil tests pursuant to Section 1823.14(f).

1823.15 The applicant will comply with the seeding and mulching requirements pursuant to Sections 1823.15, 1816.113 and 1816.114.

In making this finding, the Regulatory Authority has relied on available data and opinions of experts, as found relevant to this application. In addition, the Regulatory Authority has relied on the expert technical opinion of its staff. Such reliance was intended by Congress as is apparent in the legislative history of the Federal Act. At page 105 of the House Conference Report No. 95-493, the Conferees state:

"It is the intention of the Conferees that the written finding that the regulatory authority is required to make before a permit is granted to mine on prime farmland can be based in part on the expert opinion of the regulatory authority, the operator has the technological capability to perform the soil reconstruction standards of Section 515(b)(7) and the performance of those standards will result in the restoration of the mined area to equivalent or higher levels of agricultural yield as non-mined prime farmland in the surrounding area under equivalent levels of management. This does not mean that mining and restoration must have taken place in the surrounding area, but simply that the operator can show by agricultural school studies, or other data for comparable areas that equivalent yields can be obtained after mining."

This finding is based on significant and substantial evidence and is in keeping with the standards for prime farmland review approved by the Office of Surface Mining. (See letter from Acting Director Reeves to Illinois Director Evilsizer, dated April 7, 1980, which is incorporated by reference.)

This finding is based solely upon characteristics peculiar to this particular operator and the prime farmland soil types involved.

All materials supporting this finding are a part of the public record and are hereby incorporated by reference.

Based upon the foregoing analysis of the probable impact of the proposed operations and a review of the application and Interagency and public comments thereon, the Department finds that there is a reasonable basis on which to issue the permit as requested by Consolidation Coal Company.

Enter on behalf of the Illinois Department of Mines and Minerals, Land Reclamation Division, as Regulatory Authority.



STATE OF ILLINOIS  
DEPARTMENT OF MINES AND MINERALS  
LAND RECLAMATION DIVISION

BRAD EVILSIZER  
DIRECTOR

APPENDIX G

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IN RE: GRANDFATHERING REQUEST  
Consolidation Coal Company  
Burning Star #4 North Field

OPINION AND ORDER  
RA 83-3

Consolidation Coal Company ("Consol" or "the Company") has requested a prime farmland exemption for 1,870 acres located in the North field of its Burning Star #4 mine in Perry County. Such an exemption is available for permits and revisions or renewals of permits which contain prime farmland and which meet certain requirements under Section 510(d) of the Surface Mining Control and Reclamation Act of 1977 ("Federal Act"), commonly known as the grandfather clause. Section 510(d)(2) of the Federal states:

Nothing in this subsection shall apply to any permit issued prior to the date of enactment of this Act, or to any revisions or renewals thereof, or to any existing surface mining operations for which a permit was issued prior to the date of enactment of this Act.

The Federal Office of Surface Mining adopted final rules explaining the definition of revisions, renewals and existing surface coal mining operations. (See 46 F.R. 47721, September 29, 1981). These rules will be applied to grandfathering requests made after September 29, 1981, pursuant to Section 2.08(b) of the Illinois Surface Coal Mining Land Conservation and Reclamation Act (1981 Ill. Rev. Stat., Ch. 96 1/2 Par. 7909.01 et seq.)

§716.7 Prime farmland.

- (a) \*\*\*
- (2) Except as otherwise provided in this paragraph, the requirements of the section are applicable to any lands covered by a permit application filed on or after August 3, 1977. This section does not apply to:
  - (i) Lands on which surface coal mining and reclamation operations are conducted pursuant to any permit issued prior to August 3, 1977;  
or

- (ii) Lands on which surface coal mining and reclamation operations are conducted pursuant to any renewal or revision of a permit issued prior to August 3, 1977, or
  - (iii) Land included in any existing surface coal mining operations for which a permit was issued for all or any part thereof prior to August 3, 1977, provided that:
    - (A) Such lands are part of a single continuous surface coal mining operation begun under a permit issued before August 3, 1977; and
    - (B) The permittee had a legal right to mine the lands prior to August 3, 1977, through ownership, contract or lease but not including an option to buy, lease, or contract; and
    - (C) The lands contain part of a continuous recoverable coal seam that was being mined in a single continuous mining pit (or multiple pits if the lands are proven to be part of a single continuous surface coal mining operation) begun under a permit issued prior to August 3, 1977.
- (3) For the purposes of this section:
- (i) "renewal" of a permit shall mean a decision by the regulatory authority to extend the time by which the permittee may complete mining within the boundaries of the original permit, and "revision" of the permit shall mean a decision by the regulatory authority to allow changes in the method of mining operations within the original permit area, or the decision of the regulatory authority to allow incidental boundary changes to the original permit;
  - (ii) A pit shall be deemed to be a single continuous mining pit even if portions of the pit are crossed by a road, pipeline, railroad, or powerline or similar crossing;
  - (iii) a single continuous surface coal mining operation is presumed to consist only of a single continuous mining pit under a permit issued prior to August 3, 1977,

but may include non-contiguous parcels if the operator can prove by clear and convincing evidence that, prior to August 3, 1977, the non-contiguous parcels were part of a single permitted operation. For the purposes of this paragraph, clear and convincing evidence includes, but is not limited to, contracts, leases, deeds or other properly executed legal documents (not including options) that specifically treat physically separate parcels as one surface coal mining operation.

Consol submitted a letter dated November 2, 1982, requesting the grandfather exemption for certain portions of the North Field of its Burning Star #4 Mine. The letter documented when Consol obtained the legal right to mine the land for which the exemption is requested, and a map showing the location of the land. Consol also stated that the area for which the exemption was requested was adjacent and contiguous to an existing permit and previously grandfathered areas.

On February 14, 1983, Consol submitted another letter to the Department asking that parcels No. 23 and 24 and lots and parcels delineated on the Jamestown area map be included in the previous request. Consol submitted a map showing the additional area and listed the dates on which the legal right to mine was obtained.

On July 12, 1983, Consol submitted an affidavit that all the instruments on which it based its legal right to enter and mine the area for which the exemption is requested were filed at the Perry County Courthouse in Pinckneyville, Illinois. The letter enclosed a listing of conveyances for the proposed area and included instrument numbers for every tract. The July 12, 1983, letter from Consol describes the entire acreage for which the grandfathering exemption is requested.

Since this is not an area for which a permit was issued prior to August 3, 1977, nor is it a renewal or revision of a permit as defined by the rule, Consolidation must meet all three criteria of Section 716.17(a)(2)(iii) of the Federal regulations in order to be granted the requested exemption.

Department records show that the area for which the exemption is requested is part of a single continuous surface coal mining operation. Consol's plans for this surface mining operation were first approved under a permit issued in 1973 (#133-73). The land adjacent to the area for which the exemption is requested was "grandfathered" in 1979. The lands are part of a single continuous surface coal mining operation begun under a permit issued before August 3, 1977.

Consolidation has demonstrated its legal right to mine the areas for which the exemption is requested by showing that it acquired warranty deeds and leases for these lands prior to August 3, 1977.

**The appearance of some of the images  
following this page is due to**

**Poor Quality Original Documents**

**and not the scanning or filming processes.**

**Com Microfilm Company  
(217) 525-5860**


The land to be grandfathered is part of single continuous mining pit and is contiguous to areas for which permits were issued prior to August 3, 1977. The coal to be mined is part of a single continuous recoverable coal seam (Herrin #6 and Harrisburg #5) mined in a single continuous pit begun under a permit issued prior to August 3, 1977. The Department, therefore, concludes that the area for which the exemption is required meets the criteria necessary for grandfathering.

It must be noted that the area for which the exemption is requested is subject to the land restoration and soil reconstruction requirements of Section 515(b)(2) and 515(b)(5) of the Federal Act under the opinion in In Re: Surface Mining Litigation, 452 F. Supp. 327, 340 (1978). In addition Consolidation Coal Company is on notice of the Governor's policy statement outlined in the July 8, 1982, memo from Assistant Director Huck Huckaby to all coal operators (copy attached). Consol's acceptance of a permit, should the Department's permitting decision be in the affirmative regarding the area in question, is subject to implementation of the Governor's policy subject to rule making.

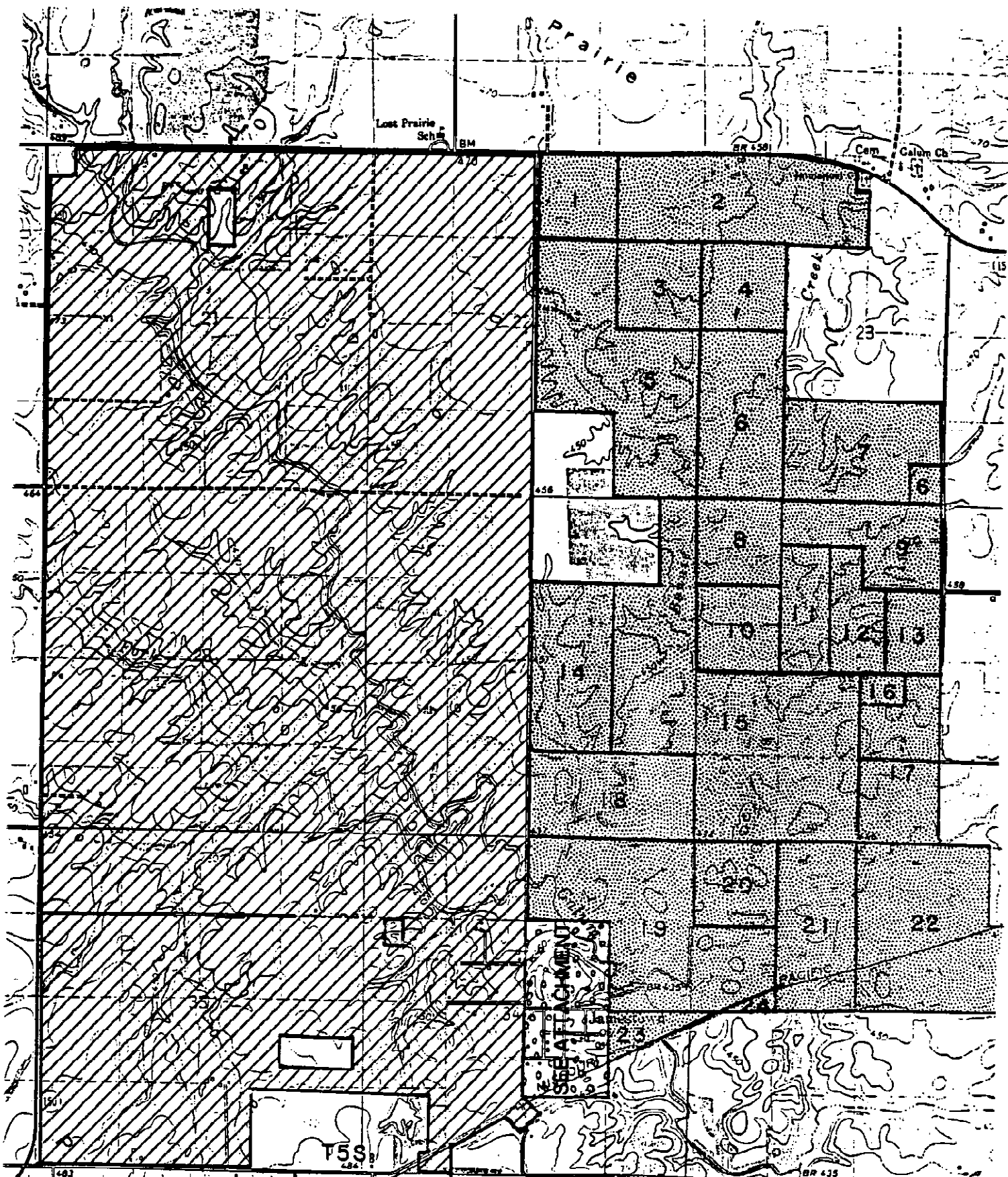
As a result of the Department's preliminary review of Consol's request, the Department has determined that the 1,870 acres at Consol's Burning Star #4 North Field Mine are eligible for a prime farmland exemption.

WHEREFORE, Consolidation Coal Company's request for a prime farmland exemption at its Burning Star #4 operation in Perry County is hereby granted.



Enter, on behalf of the Illinois Department of Mines and Minerals, Land Reclamation Division, as Regulatory Authority.

  
Brad Evilsizer, Director  
Illinois Department of Mines  
and Minerals

Dated: April 23, 1984



### LEGEND

-  PROPOSED GRANDFATHER AREA
-  EXISTING PERMIT AREA

BURNING STAR NO.

NORTH FIELD

T5S R4W PERRY CO.

MAP SCALE 1"=2000'





Consolidation Coal Company  
Mid-Continent Region  
12755 Olive Boulevard  
St. Louis, Missouri 63141  
(314) 275-2300

RECEIVED

APR 21 1986

MINE POLLUTION CONTROL PROGRAM  
MARION, ILLINOIS

Mr. Douglas Downing  
Illinois Department of Mines & Minerals  
Land Reclamation Division  
227 South 7th Street  
Room 201  
Springfield, IL 62706

Re: Burning Star #4  
North Field/East  
Permit Application No. 152

Dear Mr. Downing:

The following modifications and supporting information are submitted to your office for our Burning Star #4, North Field/East Permit Application No. 152.

Our modifications are sequentially numbered to coincide with your request letter of May 29, 1985.

Should you have any questions or need additional information, please contact this office.

Sincerely,

*Richard Hiller*

Richard Hiller  
Permit Coordinator

RH:vms

Attachments

RECEIVED

March 3, 1986  
APR 17 1986

MINE POLLUTION  
CONTROL PROGRAM

RECEIVED  
SPRINGFIELD

MAR 7 1986

DEPT. OF MINES AND MINERALS  
LAND RECLAMATION DIV.

DEPT. DIVISION OF RECORDS MANAGEMENT  
RELEASABLE

NOV 12 2015

REVIEWER: JKS

- 1) A current certificate of insurance is attached on page I-10.
- 2) Please refer to the revised Part I-2 on page I-3, the revised pre-mining land use map for locations and the revised property ownership detail sheets for addresses on pages I-13 through I-26.
- 3) Please refer to the addendum to Part II(5) on Page II-2a for land capability and productivity information.
- 4) Please refer to the revised pre-mining land use map for the locations and names of owners of adjacent property owners.
- 5) Please refer to the revised pre-mining land use map for the current use of all buildings on and within 1,000 feet of the permit area.
- 6) Please refer to the revised pre-mining land use map for the location of surface and subsurface features passing through the permit area.
- 7) Please refer to the revised mining operations map for the location of the known abandoned underground mines.
- 8) Please refer to the revised mine operation map for the location of the utility corridors.
- 9) Explosive storage areas are not planned to be located within this permit area.
- 10) Please refer to the revised pages V3 and V3a for a revised response to V(2)(B).
- 11) Refer to pages V-3b-a and the attached property map.
- 12) Please refer to the revised response to Part V(4)(G) on page V8 for commitment to use mulch as required.
- 13) Please refer to the revised land reclamation for the location of hedge rows.
- 14) The topsoil stockpiles delineated are located in advance of mining. These stockpiles will be removed prior to mining and thusly prior to the construction of the depressed haulage roads.
- 15) Please refer to the revised response to Part IV(1) for description of markers.
- 16) The existence of Consolidation Coal Company's valid existing rights within the proposed permit is demonstrated by the grandfathering of adjacent permit area #74 and the expected receipt of grandfathering of this area.

- 17) The legend used on the land reclamation map is a standardized legend designed to encompass different variables for many different reclamation plans. In that a designation is shown on the legend does not necessitate it to be on the reclamation plan. This method is a standard map practice.
- 18) Please refer to the revised response to Part IV(5)(G) on Page IV-14 for information regarding closure and abandonment.
- 19) Please refer to the revised response to Part I(4)(E) on page V-7 for complete sentence.
- 20) Please refer to the revised tables at Part II-10-C, D & E, pages II-5 and II-7a-C1-39.
- 21) Please refer to the revised pages II-2, II-5, II-7a-C1-39, V-2, V-5, Volume I; pages A-10,11 and C-6, Volume II, and Maps E and C.
- 22) Please refer to the revised responses on pages A29 through 46 and Page A298 in Volume II.
- 23) Please refer to the revised response on page B-1 in Volume II.
- 24) Please refer to the revised response on page B-5 in Volume II.
- 25) The reclamation plan for adjacent permit #74 has recently been revised to include a road to provide the required connection. This revision #1 to Permit #74 was submitted to your office on April 21, 1985.
- 26) Lateral support removal limits within the proposed permit area will not be approached. The 1" = 400' mining operations map makes it difficult to delineate rule 1816.99(c) limitations line, but the line will not be approached.
- 27) Please refer to the attached blasting notification list to accompany permit #152 to assure compliance with rule 1816.64(a)(z).
- 28) Part III - 2 - G; Page III-9

At various parts within the permit application it was stated that Mississippian sandstones were the source of supply for municipalities within the vicinity of the BS#4 Mine. This was based on communications with the Illinois State Water Survey (ISWS) in 1983 (See attached letter). The ISWS was contacted again regarding this matter in response to this modification request. After additional review, the ISWS related that their original statement was in error and that the municipal wells are indeed completed in Pennsylvanian sandstones.

Part III - 2 - G has been modified appropriately.

29) Part IV - 6 - A; Page IV-14

The neutralization potential is - 220 tons  $\text{CaCO}_3$ /1000 tons gob.

30) Schedule B's for monitoring wells MW-4-5 and MW-4D-1 are being provided. MW-4D-1 is intended to be a part of the monitoring program, however, it is sampled for water quality only.

31) Refer to revised pages V-14, 15.

32) Please refer to the revised planting list on Page V-11. Consol will also utilize species listed in the Illinois Department of Conservation February 8, 1985 comment letter.

33) Please refer to the revised Map B for a detailed drawing of 2 reference points and a starting point on the permit boundary.

34) a) Please refer to Volume I, Part IV, Pages IV-40  
b) Please refer to Volume I, Part IV, Page IV-100B

35) a) Please refer to Volume I, Map F  
b) Please refer to Volume I, Map F & Volume I, Part IV, Pages IV 111B, 111B1 and 111C  
c) Please refer to Volume I, Part IV, Page IV 39  
d) Please refer to Volume I, Part IV, Page IV 39

36) Please refer to section entitled "Post-Mining Drainage Control"

37) Please refer to the revised mining operations map for the locations of gob disposal areas. Gob will not be disposed of within the permanent stream relocation corridors or within final cut or incline areas to be reclaimed to developed water resources..

38) a) Please refer to Volume I, Part IV, Page IV 54-L  
b) Please refer to Volume I, Part IV, Page IV53  
c) Please refer to Volume I, Part IV, Pages IV 48-52

Please note redesign of pond 032. Refer to Volume I, Part IV, Pages IV 48 - IV 54L, Pages IV - 56 - IV - 61 and Map F.

39) Please note redesign of pond 032. Refer to Volume I, Part IV, Pages IV 48 - IV 54L and Map F.

40) a) Please refer to Volume I, Part IV, Page IV 38 and 38A  
b) Please refer to Volume I, Part IV, Pages IV - 65 and 66  
c) Please refer to Volume I, Part IV, Page IV 67 and 68

- 41) Please refer to Volume I, Part IV, Pages IV 96 - IV 98 and Map E
- 42) Please refer to Volume V, Part V, Page VC-2
- 43) Please refer to the revised land reclamation plan. Also, we have added hedgerows which intersect large cropland fields. The precise hedgerow locations may change upon final grading to provide for the most beneficial location (i.e. within large cropland field drainageways.)
- 44) The seed mixture listed on pages V-11 and VD-5A will be used in those areas to be reclaimed to forest and wildlife (riparian forest) plantings.
- 45) Inclines and the final cut will have side slopes graded to 50% slope for at least 5 ft. below the 440 ft. mean water level. This grading will provide enhancement of habitat in the proposed impoundments.
- 46) Please refer to Map E and pages VD-4, 5, 5A, 6, 6A and 7.
- 47) Please refer to pages VD-4, 5, 5A, 6, 6A, 7, VD-17,18,19.
- 48) Please refer to Volume VI, Part V Pages VD-16 and VD-16A
- 49) Please refer to pages VD4, 5, 5A, 6, 6A and 7.
- 50) Please refer to Volume V, Part V, Page VC-2A
- 51) Please refer to Volume VI, Part V, Page VD-7
- 52) Please refer to Volume VI, Part V, Page VD-19
- 53) Please refer to Volume VI, Part V, Page VD-16A
- 54). Please refer to Volume VI, Part V, Page VD-15 and VD-10
- 55) Please refer to the attached updated engineering certification.
- 56) Please refer to the attached updated page I-1.
- 57) Please refer to Volume I, Part V, Page V-53

Maps included in this modification submittal:

- Map B
- Map C
- Map D
- Map E
- Map F
- Surface Lease/Reclamation Plan Map
- Property Ownership Map
- Incline and Final Cut Profiles (2 pages)
- Pre- and Post-Mining Cross Section

State of Illinois  
Department of Mines and Minerals  
Division of Land Reclamation  
227 South Seventh, Room 204  
Springfield, Illinois 62706

APPLICATION FOR COAL SURFACE DISTURBANCE PERMIT

PART I

SM-1

(Application to be submitted 120 days prior to the desired effective date of the permit).

DATE: March 31, 1986

State of Illinois  
Department of Mines and Minerals  
Land Reclamation Division  
227 South Seventh, Room 204  
Springfield, Illinois 62706

1.) General Information

(I) (We) (The) Consolidation Coal Company  
(Name of Company, Corporation, Partnership or Individual)

P. O. Box 218 - Pinckneyville, IL 62274  
(Address)

618-357-5302  
(Tel. No.)

hereby make application \_\_\_\_\_ for \_\_\_\_\_ a Permit to mine  
(for, renewal or revision)  
by Surface Mining during the period February 1, 1985  
(surface mining, coal recovery operation) (Month) (Date) (Year)

to February 1, 1990, on the following area and shown on the pre-mining land use  
(Month) (Day) (Year)

map. Revision. No. -- for -- acres to be added to Permit No. --

Name of Mine Burning Star No. 4, MSHA ID No. 1211 IL 2024

I Grayson Heard, Senior Vice President-Mining, Mid-Continent Region  
(applicant or applicant's legal representative)

hereby affirm that all information provided in this application is true and correct to the best of my knowledge.

Subscribed and sworn to before me this 3rd day of March, 1986

My commission expires 9-19-88

This application is also to be used  
to apply for a:

IEPA Chapter 4 Permit Yes X No ---

Construction ---

Operation ---

Renewal ---

Modification X

Grayson Heard  
Signature of Official

Linda L. Kurland  
Notary Public

St. Louis County, State of Missouri

My Commission Expires Sept. 19, 1988

Linda L. Kurland  
Notary Public

NPDES Yes X No ---

Construction ---

Operation ---

Renewal ---

Modification X

NOTICE -- This state agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Ill. Rev. Stat., Ch. 96 1/2, Art. 4501 et seq. Disclosure of this information is voluntary however failure to comply may result in this form not being processed. This form has been approved by the Forms Management Center.

If this application is to be considered an NPDES application, the attached, "Consolidated Permits Program - Application Form 2C," must be completed.

ENGINEERING CERTIFICATION

I hereby certify the engineering design used in preparation of this application, attachments, and supplements was done by me or under my direct supervision.

I further certify to the best of my knowledge all such design is in accordance with all applicable local, state and federal laws, rules and regulations.

☒ Whereas the Reclamation Plan calls for an alternative land use, I also certify the plans conform to applicable accepted standards for adequate land stability, drainage, vegetative cover, and aesthetic design appropriate for the post-mining use of the site.

☐ Whereas the operation proposes disposal of spoil or waste materials in areas other than mine workings or excavations, I also certify such fills are designed in accordance with recognized professional standards and all applicable laws.

☒ Certification for Illinois Environmental Protection Agency - Chapter 4 Permit. In my professional judgement, the plans, and specifications submitted as part of this application describe an operation which will meet all applicable effluent and water quality standards. I certify that I am familiar with all of the plans, specifications, reports, and maps submitted as part of this application and that said plans, etc. are accurate insofar as they represent existing conditions.

Victor Ordija

Name

62-37682

Illinois Registration Number (Seal)

Consolidation Coal Company

Firm

(314) 275-2300

Phone Number

12755 Olive Blvd., St. Louis, MO 63141

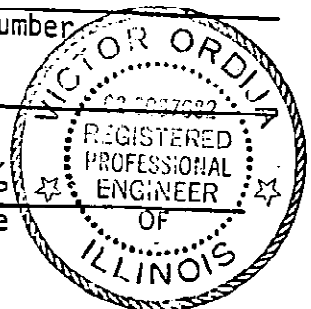
Address

*Victor Ordija*

Signature

3-3-86

Date



# **ACORD** **CERTIFICATE OF INSURANCE**

ISSUE DATE (MM/DD/YY)

12/09/85

**PRODUCER**

Marsh & McLennan, Inc.  
1221 Avenue of the Americas  
New York, NY 10020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

**COMPANIES AFFORDING COVERAGE**

COMPANY LETTER <b>A</b>	Hartford Accident & Indemnity Company
COMPANY LETTER <b>B</b>	
COMPANY LETTER <b>C</b>	
COMPANY LETTER <b>D</b>	
COMPANY LETTER <b>E</b>	

**INSURED**

Consolidation Coal Company  
Consol Plaza  
1800 Washington Road  
Pittsburgh, PA 15241

**COVERAGES**

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES.

CO LTR	TYPE OF INSURANCE		POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIABILITY LIMITS IN THOUSANDS		
							EACH OCCURRENCE	AGGREGATE
	GENERAL LIABILITY							
A	<input checked="" type="checkbox"/>	COMPREHENSIVE FORM	10 CLR P12452E	01/01/86	01/01/87	BODILY INJURY	\$	\$
A	<input checked="" type="checkbox"/>	PREMISES/OPERATIONS UNDERGROUND EXPLOSION & COLLAPSE HAZARD	10 CLR P12452E	01/01/86	01/01/87	PROPERTY DAMAGE	\$	\$
A	<input checked="" type="checkbox"/>	PRODUCTS/COMPLETED OPERATIONS CONTRACTUAL INDEPENDENT CONTRACTORS	10 JPR P12451E	01/01/86	01/01/87	BI & PD COMBINED	\$1,000	\$
A	<input checked="" type="checkbox"/>	BROAD FORM PROPERTY DAMAGE	10 CLR P12452E	01/01/86	01/01/87	PERSONAL INJURY		\$
A	<input checked="" type="checkbox"/>	PERSONAL INJURY	10 CLR P12452E	01/01/86	01/01/87			
	AUTOMOBILE LIABILITY					BODILY INJURY (PER PERSON)	\$	
	<input type="checkbox"/>	ANY AUTO				BODILY INJURY (PER ACCIDENT)	\$	
	<input type="checkbox"/>	ALL OWNED AUTOS (PRIV. PASS.)				PROPERTY DAMAGE	\$	
	<input type="checkbox"/>	ALL OWNED AUTOS (OTHER THAN PRIV. PASS.)				BI & PD COMBINED	\$	
	<input type="checkbox"/>	HIRED AUTOS						
	<input type="checkbox"/>	NON-OWNED AUTOS						
	<input type="checkbox"/>	GARAGE LIABILITY						
	EXCESS LIABILITY							
	<input type="checkbox"/>	UMBRELLA FORM				BI & PD COMBINED	\$	\$
	<input type="checkbox"/>	OTHER THAN UMBRELLA FORM						
	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY					STATUTORY		
						\$	(EACH ACCIDENT)	
						\$	(DISEASE-POLICY LIMIT)	
						\$	(DISEASE-EACH EMPLOYEE)	
	OTHER							
DESCRIPTION OF OPERATIONS/LOCATION(S) AND EMPLOYER'S NAME								

**DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS**

OPERATIONS: All operations usual to the business of the insured including surface mining and reclamation operations in the state of Illinois.

**CERTIFICATE HOLDER**

Illinois Dept. of Mines & Minerals  
Division of Land Reclamation  
227 S. Seventh Street - Rm 204  
Springfield, IL 62706  
Attn: Permit Coordinator

**CANCELLATION**

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 10 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

Frank Prentice Haggood

*Frank Prentice Haggood*



- 2) Provide name and address of every legal or equitable owner of record of the permit area.

Please refer to the property ownership information on pages I-13 through I-26.

Provide name and address of the owner of record for all surface and subsurface areas contiguous to any part of the proposed permit area.

Please refer to the pre-mining land use map for contiguous owners, and page I-27 for addresses.

Provide location of surface owners of record on premining land use map or another map if necessary.

Not applicable.

- 3) Provide name and address of any holder of record of leasehold interest for the permit area.

Consolidation Coal Company  
P. O. Box 218  
Pinckneyville, IL 62274-0218

- 4) Provide name and address of any purchaser of record under a real estate contract of the property for the permit area.

None exist within the proposed permit area.

# **PROPERTY OWNERSHIP DETAILS**



Agency ID: 170001458367

Media File Type WATER

Bureau ID: W1458990016

Site Name: Consolidation Coal burnng Star4

Site Address1: 2.5 Miles NE Of

Site Address2:

Site City: Cutler

State: IL

Zip: 62274-

**This record has been determined to  
be partially or wholly exempt from  
public disclosure**

**Exemption Type:**

**Redaction**

**Exempt Doc #: 9**

**Document Date: 7/19/2010**

**Staff: JKS**

**Document Description:** PERMIT APPLICATION -MODIFICATIONS AND SUPPORTING  
INFORMATION: PART I, PART IV, PART V (DATED: 04/17/1986)(VOLUME  
#11)

**Category ID:** 16







**Category Description:** NPDES PERMITS/BACKUP

**Exempt Type:** Redaction

**Permit ID:** IL0052795

**Date of Determination:** 11/12/2015

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT- ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
026-016	SE NE, NE SE, NW NW exc.: Beg. NE, W to NW <sup>c</sup> , S 72 rds. 10 links N 59°E(compass set @ 4°3') 88 rd.27 links to E <sub>L</sub> , N 31 rds. to beg.); SW NW NW SW	26-5-4          25-5-4 25-5-4	C          C C		WD	249	799	3-10-61
026-017	SW NE SE NW S½ NE NW Beg. NW NWSE S 28 rds., E 21 rds, NEly to pt. on N 42 rds E NW, W <sup>L</sup> to beg. Beg. <sup>c</sup> NW, E 42 rd. to pt: S parallel W/L <sub>L</sub> 28 rd., W21 rd., NE to pt.	26-5-4 26-5-4 26-5-4 26-5-4       26-5-4	C C C C       C		WD 817894	252	229-230	7-15-68
026-019	E½ NE SE	35-5-4	S&C		WD			11-3-62
026-019A	NW SE W½ NE SE	35-5-4 35-5-4	S&C S&C		AD WD			11-3-62 11-3-62
026-020	E½ SW NE NE NE	26-5-4 27-5-4	S&C S&C		WD 638516	149	175	11-27-48
026-022	E½ NE	34-5-4	S&C		WD 641884	149	226-227	6-18-49

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

T-15

EEL/cjm 6-18-84

3.

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT-ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
026-034	E $\frac{1}{2}$ SW SW	26-5-4	S&C	[REDACTED]	WD 640383	149	193	2-14-49
026-037	SW SW E $\frac{1}{2}$ SE SE	27-5-4 28-5-4	S&C S&C	[REDACTED]	WD 640524	149	199	2-25-49
026-039	W $\frac{1}{2}$ SW SW	26-5-4	S&C	[REDACTED]	WD 641889	149	227	6-18-49
026-040	W $\frac{1}{2}$ NW SW	26-5-4	S&C	[REDACTED]	WD 640452	149	197	2-19-49
026-043	SE SE	34-5-4	S&C	[REDACTED]	WD 642828	163	211-212	9-13-49
026-044	SW NW N-RR	35-5-4	S&C	[REDACTED]	WD 641118	158	562-563	4-16-49
026-045	S $\frac{1}{2}$ NW NE NW	33-5-4 34-5-4	S&C S&C	[REDACTED]	WD 641811	149	224-225	6-10-49
026-047	S $\frac{1}{2}$ SE	27-5-4	S&C	[REDACTED]	WD 655199	173	198	9-26-47
026-048	NW SW	27-5-4	S&C	[REDACTED]	WD 642204	149	231	7-21-47
026-049	SW SE	34-5-4	S&C	[REDACTED]	WD 649804	170	95-96	2-26-51
026-051	SW SE SW	35-5-4	S&C	[REDACTED]	WD	148A	197-198	6-28-46
026-053	SE SW	27-5-4	S&C	[REDACTED]	WD 636556	156	381	4-12-48
026-056	NE SE NE NW SE NW E $\frac{1}{2}$ SW SW E $\frac{1}{2}$ NW SW SW NW SW NE SW	34-5-4 35-5-4 35-5-4 35-5-4 35-5-4 35-5-4 35-5-4	S&C C C C C C C	[REDACTED]	WD 649805	171	17-18	6-26-51

4.

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT-ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
026-057	SE SE SW	35-5-4	S&C	[REDACTED]	WD 629070	148A	175-176	6-21-46
026-058	S $\frac{1}{2}$	21-5-4	S&C	Burr Oak Coal Corp.	QCD641465	161	21	5-9-49
	Total	26-5-4	S&C					
	Total	27-5-4	S&C					
	Total	28-5-4	S&C					
	Total	33-5-4	S&C					
	Total	34-5-4	S&C					
	Total	35-5-4	S&C					
	W $\frac{1}{2}$	1-6-4	S&C					
	Total	2-6-4	S&C					
	Total	3-6-4	S&C					
026-060	E $\frac{1}{2}$ NE NE	35-5-4	S& $\frac{1}{2}$ C	[REDACTED]	WD	228	23	12-16-63
	N-RR							
	N $\frac{1}{2}$ NW (exc.	36-5-4	S& $\frac{1}{2}$ C					
	W 1 $\frac{1}{2}$ Ac. S-RR)							
026-062	W $\frac{1}{2}$ SW SW	35-5-4	S&C	[REDACTED]	WD 633339	152	358-359	6-11-47
026-063	E $\frac{1}{2}$ NE NE N-RR	35-5-4	$\frac{1}{2}$ C	[REDACTED]	WD	243	403	11-15-66
	N $\frac{1}{2}$ NW (Exc.	36-5-4	$\frac{1}{2}$ C					
	W 1 $\frac{1}{2}$ Ac. S-RR)							
026-064	NE SW	35-5-4	S	[REDACTED]	WD 630002	148A	376-377	8-29-46
	E $\frac{1}{2}$ NW SW	35-5-4	S					
	E $\frac{1}{2}$ SW SW	35-5-4	S					
	SW NW SW	35-5-4	S					
026-065	Beg. NE SE	34-5-4	S	[REDACTED]	WD 816336	250	387-388	4-22-68
	NW, W 20 rod, S							
	40 rod, E 20 rod,							
	N 40 Rod							
026-066	SW NE	34-5-4	C	[REDACTED]	QCD639847	155	258-259	12-22-48
026-067	SW SE	26-5-4	S&C	[REDACTED]	WD 827496	272	303-304	12-13-71
	NW NW	26-5-4	S&C					
	NW SE (exc. N	26-5-4	S&C					
	28 rods of W							
	42 rods)							

5.

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT- ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
026-068	Beg. 2 rod N SW SE NW, E 20 <sup>c</sup> rod, N 8 rod, W 20 rod, S 8 rod. Beg. 2 rod N SW SE NW, N 35 <sup>c</sup> rod 9½', E 19 rod 13', S 35 rod 9½', W 19 rod 13'	34-5-4    34-5-4	S    S	[REDACTED]	WD 818913	253	649-650	12-3-68
026-069	SE SW	34-5-4	S&C	[REDACTED]	QCD642130	155	339-340	7-13-49
026-071	SW SW S-RR NW SE S-RR	34-5-4 34-5-4	S&C S&C	[REDACTED]	QCD642504	155	355-356	8-16-49
026-072	NW NW SW	35-5-4	S&C	[REDACTED]	QCD643355	162	212-213	10-25-74
062-074	W 2 rod SW SW Beg. 1165' W, 1085'S NE SW SW, S 234', W160', N 234', E 160' S½ NW SE S½ NE SE S½ SE	34-5-4 34-5-4    33-5-4 33-5-4 33-5-4	S S    S&C S&C S&C	[REDACTED]	WD 826677	271	81-82	8-27-71
026-074A	NW SW SW NE N½ NW SE N½ NE SE	34-5-4 33-5-4 33-5-4 33-5-4	S&C S&C S&C S&C	[REDACTED]	WD 821679	260	485-486	12-29-69
026-075	W¼ SW NE E 25 Ac. of SE NW & S½ NE NW	26-5-4 26-5-4  	S&C S&C  S&C	[REDACTED]	WD 820961	258	193-194	9-10-69
026-079	2 Ac. SE SW NW S-RR Jamestown Lots	35-5-4  34-5-4	S&C  S&C	[REDACTED]	WD 821244	258	557-558	10-22-69



6.

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT- ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
026-082	Beg. 351' W, 33'N SE SE NW, W36 <sup>c</sup> .5 rod, N36.5 rod, E 36.5 rod, S 36.5 rod.	34-5-4	S	[REDACTED]	WD824807	266	493-494	12-21-70
026-083	SW SW SW SW (Exc. W 2 rod) (Exc.Beg.SE SW SW, N 19 <sup>c</sup> rod to S <sub>L</sub> RR, SW to S <sub>L</sub> SW SW, E 32 rod to beg.) (Exc.beg.289' S NE SW SW, S 209', W 209', N209', E209').(Exc.beg.498' S NE SW SW S 209', W 209', N 209', E 209').(Exc. beg.707' S, 249'W NE SW SW, W209' S209', E209', N 209').(Exc. beg. 916' S, 249'W NE SW SW, W 418', S 348', NEly 477' to pt. 249' W L, N 125') (Exc.beg. 80 <sup>+</sup> S NE SW SW, S 209', W 209', N 209', E 209'). (Exc. beg.NE SW SW, S 80',W209', N80', E209') (Exc.Beg. E SW SW @ N <sub>L</sub> Pub. Rd. N-RR, N 209', W 209', S to Rd., NE to beg.).	34-5-4 34-5-4	C S	[REDACTED]	WD823376	263	499-502	6-19-70

7.

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT- ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
026-083 (continued)								
	(Exc. 1165' W, 1125' S NE SW SW, S 194', W <sup>c</sup> 160', N 194', E 160') (Exc. N 40' of: Beg. 1165' W, 1085' S NE SW SW, S 234', W 160', N 234', E 160')							
026-086	S 15 Ac. of NE SW S 15 Ac. of NW SE SE SW SW SE (exc. SE SW SE)	23-5-4	.3(S&C)	[REDACTED]	AD 827168	271	741-742	10-28-71
026-086A	See 086	23-5-4	.3(S&C)	[REDACTED]	WD 827160	271	729-730	10-27-71
026-086B	See 086	23-5-4	.3(S&C)	[REDACTED]	WD 827159	271	727-728	10-27-71
026-086C	See 086	23-5-4	1/30(S&C)	[REDACTED]	WD 827229	271	811-812	11-2-71
026-086D	See 086	23-5-4	1/30(S&C)	[REDACTED]	WD 827244	272	3-4	11-5-71
026-086E	See 086	23-5-4	1/30(S&C)	[REDACTED]	WD 827245	272	5-6	11-5-71
026-089A	N28 rod of W42 rod of NW SE SE NW S <sup>1</sup> / <sub>2</sub> NE NW (Exc. E 25 ac.)	26-5-4	S&C	[REDACTED]	WD 830679	279	643-644	10-27-72
026-089B	E 3/4 SW NE	26-5-4	S&C	[REDACTED]	WD	258	241	9-19-69

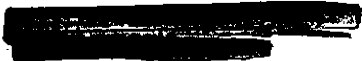


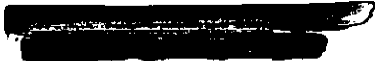

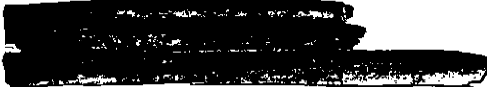
B.

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT- ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
026-090	NE NE S-RR	35-5-4	S&C	[REDACTED]	WD 821788	260	631-632	1-16-70
026-091	W 35 Ac. NW SW W $\frac{1}{2}$ NE NE NW NE SW NE SE NE Beg. SW NW NW N to S <sup>c</sup> RR, E, S to L <sup>L</sup> , W to beg. so as to incl. 1 $\frac{1}{2}$ Ac.	36-5-4 35-5-4 35-5-4 35-5-4 35-5-4 36-5-4	S&C S&C S&C S&C S&C S&C	[REDACTED]	WD 832026	281	727-728	4-5-73
026-096	E $\frac{1}{2}$ NW	35-5-4	S	[REDACTED]	WD 859370	332	443-444	1-19-81
026-097	NW NW, E $\frac{1}{2}$ NE SW NE NW SE NW NE NE SE NW SW  NW SW NE SE, SE NE NE NE, NW NE	35-5-4 3-6-4 3-6-4 3-6-4 3-6-4 3-6-4 2-6-4  2-6-4 3-6-4 3-6-4	SL&CL SL&CL SL&CL SL&CL SL&CL SL&CL SL&CL  SL SL SL	[REDACTED]	ML	263	275-278	5-28-70
					CLA 858129	330	795-800	8-26-70
026-108	NW SW SE NW NE NW W $\frac{1}{2}$ NE SE SW S $\frac{1}{2}$ SW SW SE SW S $\frac{1}{2}$ SW SW	28-5-4 3-6-4 3-6-4 1-6-4 4-6-4 4-6-4 4-6-4 4-6-4	S&C S&C S&C S&C S S C	S.W.I.C.C.	WD 824561	266	253-256	11-25-70

9.

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT- ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
	E $\frac{1}{2}$ SE NE SE NE NW SE NE NE SE NW NW(exc. beg. NE, W to NW, S $\frac{1}{2}$ rod 10 <sup>c</sup> links, N 59° 88 rod, 27 links, N 31 rod, SW NW, NW SW	29-5-4 32-5-4 36-5-4 26-5-4 26-5-4 25-5-4	S&C S&C S&C C C C	Out Conveyance to S.W.I.C.C.	CWD 824611	266	348-350	12-7-70
026-110	NE NE N-RR Jamestown Lots	4-6-4 34-5-4	S&C		WD 829177	276	765-766	6-21-72
026-111	Beg. 17 rod S NW SE NW, S $\frac{1}{2}$ rod, E 20 rod, N 23 rod, W 20 rod	34-5-4	S		WD 829958	277	777-778	9-5-72
026-114	NE NW, SE NW	34-5-4	S&C		QCD			7-16-71
026-120	W $\frac{1}{2}$ SW SE SW SE (Exc. $\frac{1}{2}$ ac. Cem.)	23-5-4 23-5-4	S&C S&C		WD 831257	280	453-454	1-12-73
026-120A	15 $\frac{1}{2}$ Ac. of W NE NE NW NE N $\frac{1}{2}$ NE NW	26-5-4 26-5-3 26-5-3	S&C S&C S&C		WD 859127	332	109-110	12-15-80
026-123	Beg. 289'S NE SW SW, S 209', W 209', N 209', E 209'	34-5-4	S		WD 839490	280	795-796	2-7-73

10.

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT-ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
026-140	Beg. 498'S NE SW SW, S 209', W 209', N 209', E 209'	34-5-4	S	[REDACTED]	WD 832809	283	809-810	7-2-73
026-141	Beg. 916' S, 249' W NE SW SW, W 418', S <sup>C</sup> 348', NEly 477' to pt. 249' W L <sub>L</sub> , N 125'	34-5-4	S	[REDACTED]	WD 831708	281	299-300	3-5-73
026-142	Beg. NE SW SW, S 289', W 209', N 289', E 209'	34-5-4	S	[REDACTED]	WD 831803	281	399-400	3-6-73
026-143	Beg. 707'S, 249' W NE SW SW, W 209', S 209', E 209', N 209'	34-5-4	S	[REDACTED]	WD 833712	284	629-360	8-22-73
	Beg. E <sub>L</sub> SW SW @ N <sub>L</sub> Pub.Rd. N <sub>L</sub> -RR, N 209', W <sub>L</sub> 209', S to Pub.Rd., NE to beg.	34-5-4	S					
	Beg. 916'S, 249' W NE SW SW, W 418', S 348' to Pub. Rd., NEly 477', N 415' to beg.	34-5-4	S					
026-162	S <sub>1</sub> SW E <sub>1</sub> NW (Exc. 1 Ac. NW ) (Exc. S <sup>5</sup> Ac.) NE NW	21-5-4 27-5-4 28-5-4	S&C S&C S&C	[REDACTED]	WD 855073	325	217-220	9-12-79

11.

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT- ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
026-169	NE NW	22-5-4	S	[REDACTED]	WD 846287	309	37-38	3-11-77
026-172	SW NE	27-5-4	S&C	[REDACTED]	WD 847789	310	851-852	8-9-77
	NW SE	27-5-4	S&C	[REDACTED]				
026-175	N $\frac{1}{2}$ NW	23-5-4	SL&CL	[REDACTED]	ML	310	625-628	7-19-77
	NE NE	22-5-4	SL&CL	[REDACTED]				
026-176	SE NE	22-5-4	SL&CL	[REDACTED]	ML	310	649-652	7-19-77
026-177	SW NE	22-5-4	SL&CL	[REDACTED]		310	637-640	7-19-77
	NW SE	22-5-4	SL&CL	[REDACTED]		310	641-644	7-19-77
	E $\frac{1}{2}$ SE	22-5-4	SL&CL	[REDACTED]		310	633-636	7-19-77
				[REDACTED]		IL310	646-648	7-19-77
026-178	SW NW	23-5-4	SL&CL	[REDACTED]	ML 847748	310	813-816	8-3-77
026-179	NW NE	22-5-4	SL&CL	[REDACTED]	ML	310	629-632	7-19-77

12.

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT-ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
026-192	W $\frac{1}{2}$ NE S Rte. 154	23-5-4	SL&CL	[REDACTED]	ML 853719	323	267-272	5-7-79
	N 25 Ac. of NE	23-5-4	SL&CL	[REDACTED]				
	SW, N25 Ac. of	23-5-4	SL&CL	[REDACTED]				
	NW SE			[REDACTED]				
	SE NW (exc. E 43 rod of S 8 rod. 6')	23-5-4	SL&CL	[REDACTED]				
	SW SE	22-5-4	SL&CL	[REDACTED]				
	NE SW	22-5-4	SL&CL	[REDACTED]				
	N $\frac{1}{2}$ SE SW	22-5-4	SL&CL	[REDACTED]				
	Beg. SE SE NW N 8 rods 6', W 43 rods, S 8 rods, 6', E 43 rod	22-5-4	SL&CL	[REDACTED]				
	SW SW	22-5-4	SL&CL					
	NW NE	27-5-4	SL&CL					
	W $\frac{1}{2}$ NE NE	27-5-4	SL&CL					
026-195	Jamestown Lots	34-5-4	S&C	[REDACTED]	WD 855832	326	131-132	12-4-79
	NE SW	34-5-4	S					
	SE SW N-RR	34-5-4	S					
	NE NE	34-5-4	C					
	NW SW	34-5-4	C					
	E $\frac{1}{2}$ SW	34-5-4	C					
026-196	SE NW	23-5-4	SL&CL	[REDACTED]	ML 853720	323	273	5-7-79
026-200	Beg. 20 rod E. NW SE NW, E 20 rods, S 11 rods, W 20 rods, N 11 rod	34-5-4	S	[REDACTED]	WD 853548	323	63-64	4-16-79
026-213	Beg. 32' N, 25' W SE SE NW, W 146', N 300', E 146', S 300' (Exc. Lots 1&2 Blk.2-Sprague Add.) Jamestown Lots	35-5-4     34-5-4	S     S	[REDACTED]	WD 866814	345	255-256	5-11-83

13.

BURNING STAR #4  
PROPERTY CONTROL  
BONNIE CREEK PERMIT AREA

TRACT NO.	DESC.	LOC: S/T/R	CONT- ROL	NAME	DEED TYPE	BOOK	PAGE	DATE REC.
026-217	SE NW Beg. 50'W, 350' N NW Blk. 3 Spragues Add., W 17 rod, N9½ rod, E 17 rod S9½ rod.	34-5-4 34-5-4	S S	Perry County Circuit Court	Case #83-CH-15			9-12-83

EEL/cjm 6-18-84



Pyritic sulfur	1.16%
Sulfate sulfur	0.05%
Organic sulfur	<u>2.15%</u>
Total	3.36%

- 3) Provide slope measurements to represent existing land surface configuration of proposed permit area as required under Rule 1779.25(k)(1-3). A soils map of medium intensity prepared to SCS specifications or a contoured aerial photo may be submitted in lieu of 1779.25(k)(1-3).

Please refer to Part V, Map C, Soils Map.

- 4) Has some or all of the land been disturbed previously by surface or deep mining? Yes X No \_\_\_\_\_. If yes, delineate on the premining land use map the degree of reclamation and, if applicable, that state law under which reclamation was accomplished. What coal seam or other mineral was extracted? Check one or more:

☐ Pre-law  
☐ Open Cut Land Reclamation Act (1962)  
☐ The Surface-Mined Land Reclamation Act (1968)  
☐ Surface-Mined Land Conservation and Reclamation Act (1971)  
☐ Surface-Mined Land Conservation and Reclamation Act, (Amended 1975)  
☒ Deep Mining and Associated Disturbances

Describe condition of previous reclamation efforts. Describe and locate land uses adjacent to the previously affected area on the premining land use map.

None of the proposed permit area has been previously disturbed by surface mining. Old underground works exist as shown in Part VI, Map D, Mining Operations, but no surface disturbance from the underground works was incurred. The Elm Grove Mining Company removed the #6 coal seam.

- 5) Give the acreages of each land use within the proposed permit area, employing land use categories of Rule 1701.5 listed below, and delineate on premining land use map existing land uses in the proposed permit area and within 1,000 feet adjacent to it. Include on the premining land use map the location of all buildings and identify the current use of these buildings.

The proposed permit area contains the following land uses:

	Overburden Removal	Other Disturbance
Cropland	1270.0	36.9
Pasture	141.0	4.4
Woodland	425.2	7.7
Developed Water Resources	37.8	1.1
Industrial/Commercial (Roads)	30.7	1.2
Residential	33.7	16.9
Undeveloped	37.1	.3
	<u>1975.5 ac.</u>	<u>68.5 ac.</u>

- A) Cropland means land used for the production of adapted crops for harvest, alone or in a rotation with grasses and legumes, and includes row crops, harvest, alone or in a rotation with grasses and legumes, and includes row crops, small grain crops, hay crops, nursery crops, orchard crops, and other similar specialty crops. Land used for facilities in support of cropland farming operations which is adjacent to or an integral part of these operations is also included for purposes of these land use categories.
- B) Pastureland or land occasionally cut for hay. Land used primarily for the long term production of adapted, domesticated forage plants to be grazed by livestock or occasionally cut and cured for livestock feed. Land used for facilities in support of pastureland or land occasionally cut for hay which is adjacent to or an integral part of these operations is also included.
- C) Developed water resources. Includes land used for storing water for beneficial uses such as stockponds, irrigation, fire protection, flood control and water supply.
- D) Woodland. Land used or managed for the long-term production of wood, wood fiber, or wood derived products. Land used for facilities in support of forest harvest and management operations which is adjacent to or an integral part of these operations is also included.
- E) Residential. Includes single-and multiple-family housing. Land used for facilities in support of residential operations which is adjacent to or an integral part of these operations is also included. Support facilities include, but are not limited to, vehicle parking and open space that directly relate to the residential use.

# Soil Mapping Units Not Subject to Rule 1785.17

Mapping Unit	Acreage	Soil Type	Capability Class	Slope Classification	% Slope Range
2	51.4	Cisne Silt Loam	III W	A	---
3A	4.5	Hoyleton Silt Loam	II W	A	0 - 2%
3B	32.9	Hoyleton Silt Loam	II E	B	2 - 4%
5C3	92.2	Blair Silty Clay Loam	IV E	C	5 - 10%
5D	11.0	Blair Silt Loam	IV E	D	10 - 18%
5D3	20.3	Blair Silty Clay Loam	VI E	D	10 - 15%
8E	28.0	Hickory Loam	VI E	E	18 - 30%
8E3	4.2	Hickory Clay Loam	VII E	E	18 - 30%
108	172.6	Bonnie Silt Loam	III W	A	0 - 2%
164A	130.5	Stoy Silt Loam	II W	A	0 - 2%
164B	200.0	Stoy Silt Loam	II E	B	2 - 4%
164B2	63.4	Stoy Silt Loam	II E	B	2 - 6%
165	123.1	Weir Silt Loam	III W	A	---
214B	72.6	Hosmer Silt Loam	II E	B	2 - 5%
214C3	178.0	Hosmer Silty Clay Loam	IV E	C	5 - 10%
382	517.2	Belknap Silt Loam	II W	A	---
787	16.7	Banlic Silt Loam	II W	A	0 - 2%
350D3	89.5	Hickory-Hosmer Silty Clay Loam	IV E	D	10 - 18%
900E	6.2	Hickory-Wellston Silt Loam	VI E	E	18 - 30%
912A	29.1	Hoyleton-Darmstadt	IV W	A	0 - 2%
912B2	95.4	Darmstadt-Hoyleton	IV E	B	2 - 6%
1108	10.2	Bonnie Silt Loam, Wet	V W	A	---

TOTAL 1965.8

ACREAGE SURVEY  
Burning Star No.4 Mine, East of Jamestown

Mapping Unit	Qualify as Prime	Soil Type	To Be Mined Acreage	Other Disturbance Acreage	Total Permit Acreage
2	Yes	Cisne Silt Loam	52.0	2.6	54.6
3A	Yes	Hoyleton Silt Loam	3.3	1.2	4.5
3B	Yes	Hoyleton Silt Loam	36.6	0.6	37.2
5C3		Blair Silty Clay Loam	87.3	4.9	92.2
5D		Blair Silt Loam	10.7	0.3	11.0
5D3		Blair Silty Clay Loam	19.2	1.1	20.3
8E		Hickory Loam	28.0	--	28.0
8E3		Hickory Clay Loam	4.2	--	4.2
108	Yes	Bonnie Silt Loam	170.6	3.4	174.0
164A	Yes	Stoy Silt Loam	149.8	5.3	155.1
164B	Yes	Stoy Silt Loam	212.7	11.3	224.0
164B2	Yes	Stoy Silt Loam	71.8	1.7	73.5
165		Weir Silt Loam	121.2	1.9	123.1
214B	Yes	Hosmer Silt Loam	74.9	6.8	81.7
214C3		Hosmer Silty Clay Loam	169.3	8.7	178.0
382	Yes	Belknap Silt Loam	505.7	13.0	518.7
787	Yes	Banlic Silt Loam	16.7	--	16.7
850D3		Hickory/Hosmer Silty Clay Loam	86.5	3.0	89.5
900E		Hickory Wellston Silt Loam	5.6	0.6	6.2
912A		Hoyleton-Darmstadt	27.9	1.2	29.1
912B2		Darmstadt-Hoyleton	95.0	0.4	95.4
1108		Bonnie Silt (Wet) Loam	10.2	--	10.2
Water			16.3	0.5	16.8
SUMMARY			1975.5	68.5	2044.0

(Revised 1/30/86)

- E. List each map unit of High Capability Lands in the permit area and give acreages for each with respect to areas which will incur actual mining (removal of overburden and extraction of coal) and to areas which will incur other forms of disturbance (road, ditches, etc.).

Soil Mapping Units by Land Use  
To be Mined Area (Overburden Removal and/or Deposition)

Mapping Unit	To Be Mined Acreage	Prime Farmland				Prime Farmland Acquired Prior to 7-3-77				High Capability				Other Lands				Roads	Water	Resid.
		Crop-Land	Wood-Land	Pasture	Undev.	Crop-Land	Wood-Land	Pasture	Undev.	Crop-Land	Wood-Land	Pasture	Undev.	Crop-Land	Wood-Land	Pasture	Undev.			
2	52.0	3.2	--	--	--	47.9	--	--	--	--	--	--	--	--	--	--	--	0.9	--	--
3A	3.3	--	--	--	--	3.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3B	36.6	4.3	--	--	--	26.0	4.0	1.0	--	--	--	--	--	--	--	--	--	1.3	--	--
5C3	87.3	--	--	--	--	--	--	--	--	--	--	--	--	69.0	1.0	12.3	1.7	1.2	--	2.1
5D	10.7	--	--	--	--	--	--	--	--	--	--	--	--	--	6.7	0.2	--	0.2	--	3.6
5D3	19.2	--	--	--	--	--	--	--	--	--	--	--	--	11.8	0.6	5.6	1.1	0.1	--	--
8E	28.0	--	--	--	--	--	--	--	--	--	--	--	--	0.8	18.9	8.1	0.1	0.1	--	--
8E3	4.2	--	--	--	--	--	--	--	--	--	--	--	--	3.3	0.8	--	--	0.1	--	--
108	170.6	1.4	--	0.8	--	84.0	72.3	10.9	--	--	--	--	--	--	--	--	--	1.2	--	--
164A	149.8	24.1	13.7	2.0	--	96.2	8.9	--	--	--	--	--	--	--	--	--	--	2.9	--	2.0
164B	212.7	21.5	10.2	2.0	--	135.4	29.1	0.5	0.3	--	--	--	--	--	--	--	--	5.7	--	8.0
164B2	71.8	9.3	1.4	--	--	54.9	0.8	0.7	--	--	--	--	--	--	--	--	--	1.0	--	3.7
165	121.2	--	--	--	--	--	--	--	--	67.4	50.9	0.1	--	--	--	--	--	2.8	--	--
214B	74.9	8.1	0.3	16.5	--	36.8	9.1	0.7	1.0	--	--	--	--	--	--	--	--	0.6	--	1.8
214C3	169.3	--	--	--	--	--	--	--	--	--	--	--	--	139.7	14.6	4.4	0.5	3.4	--	6.7
382	505.7	1.5	0.5	48.8	--	239.9	145.2	8.9	30.3	--	--	--	--	--	--	--	--	6.6	21.5	2.5
787	16.7	--	--	--	--	7.9	--	8.5	0.3	--	--	--	--	--	--	--	--	--	--	--
850D3	86.5	--	--	--	--	--	--	--	--	--	--	--	--	59.5	22.0	2.3	1.8	0.7	--	0.2
900E	5.6	--	--	--	--	--	--	--	--	--	--	--	--	0.1	4.1	--	--	--	--	1.4
912A	27.9	--	--	--	--	--	--	--	--	27.7	--	0.2	--	--	--	--	--	--	--	--
912B2	95.0	--	--	--	--	--	--	--	--	85.0	--	6.5	--	--	--	--	--	1.8	--	1.7
1108	10.2	--	--	--	--	--	--	--	--	--	--	--	--	--	10.1	--	--	0.1	--	--
Water	16.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.3	--
1975.5		73.4	26.1	70.1	--	732.3	269.4	31.2	31.9	180.1	50.9	6.8	--	284.2	78.8	32.9	5.2	30.7	37.8	33.7

Adjustments 2/3/86: + 21.5 Ac. 382 Creek Channel  
- 21.5 Ac. 382 Woodland

E. (Continued)

Soil Mapping Units by Land Use  
Other Disturbance Areas

Mapping Unit	Other Dist. Acreage	Prime Farmland				Prime Farmland Acquired Prior to 7-3-77 High Capability				High Capability				Other Lands				Roads	Water	Resid.
		Crop-Land	Wood-Land	Prime Farmland		Crop-Land	Wood-Land	High Capability		Crop-Land	Wood-Land	Other Lands								
				Pasture	Undev.			Pasture	Undev.			Pasture	Undev.							
2	2.6	--	--	--	--	2.6	--	--	--	--	--	--	--	--	--	--	--	--	--	
3A	1.2	--	--	--	--	0.7	--	0.5	--	--	--	--	--	--	--	--	--	--	--	
3B	0.6	--	--	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	
5C3	4.9	--	--	--	--	--	--	--	--	--	--	--	3.9	--	1.0	--	--	--	0.3	
5D	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
5D3	1.1	--	--	--	--	--	--	--	--	--	--	--	1.1	--	--	--	--	--	0.3	
8E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
8E3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
108	3.4	--	--	--	--	2.4	--	--	--	--	--	--	--	--	--	--	--	--	--	
164A	5.3	0.5	--	--	--	1.1	--	--	--	--	--	--	--	--	--	--	--	--	1.0	
164B	11.3	2.5	--	0.3	--	4.4	0.4	1.5	--	--	--	--	--	--	--	--	0.1	--	3.6	
164B2	1.7	0.8	--	--	--	0.3	0.2	--	--	--	--	--	--	--	--	--	0.7	--	1.5	
165	1.9	--	--	--	--	--	--	--	--	1.9	--	--	--	--	--	--	--	--	0.4	
214B	6.8	1.0	--	0.2	--	2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	
214C3	8.7	--	--	--	--	--	--	--	--	--	--	--	3.5	0.2	--	--	--	--	3.1	
382	13.0	--	--	--	--	5.5	6.2	0.4	0.3	--	--	--	--	--	--	--	--	0.6	5.0	
787	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
85003	3.0	--	--	--	--	--	--	--	--	--	--	--	0.6	0.3	0.2	--	0.2	--	1.7	
900E	0.6	--	--	--	--	--	--	--	--	--	--	--	--	0.4	--	--	0.2	--	--	
912A	1.2	--	--	--	--	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--	
912B2	0.4	--	--	--	--	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	
1108	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Water	0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5	--	
68.5		4.8	--	0.5	--	19.5	6.8	2.7	0.3	3.5	--	--	--	9.1	0.9	1.2	--	1.2	1.1	16.9

Adjustments 2/3/86 + 0.6 382 Creek Channel  
 - 0.6 382 Woodland

Refer to the acreage survey Part II10e for prime farmland soil mapping units currently used for cropland. These acres are divided into two categories: prime farmland-cropland and prime farmland acquired prior to 7/3/77 - cropland which will be reclaimed to prime farmland-cropland and high capability 100% productivity cropland respectively.

Fourteen acres of soil mapping unit 108 & 48.3 acres of soil mapping unit 382 are currently not used for cropland; however, these areas were used for cropland prior to acquisition. This additional 62.3 acres will be reclaimed to high capability 100% productivity cropland.

The remaining prime farmland soil mapping units are not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to attached NEGATIVE DETERMINATION AFFIDAVITS for each property tract, pages 1-39.

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-179  
Section 22 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-179 (S.L. & C.L.)

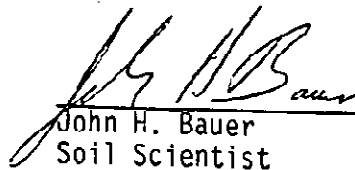
Acquisition Date 6/27/77

Brief Description:

Township Road along the Western Edge of the Property.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist  
2/4/86  
Date



NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property #026-175 (S.L. & C.L.) Acquisition Date: 6/15/77  
Section 22 Township 5S, Range 4W

All Prime Farmland Units are used for Cropland.

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-177  
Section 22 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-177 (S.L. & C.L.)

Acquisition Date 6/27/77

**Brief Description:**

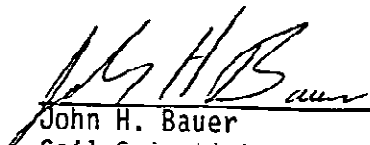
With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34 & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86 Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property #026-176 (S.L. & C.L.) Acquisition Date: 6/27/77  
Section 22 Township 5S, Range 4W

All Prime Farmland Units are used for Cropland.

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-192  
Section 22 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-192 (S.L. & C.L.)

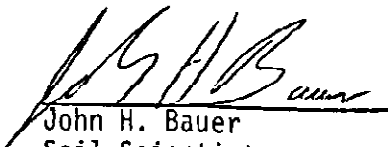
Acquisition Date 8/21/78

Brief Description:

The woodland areas are presently being logged.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86 Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property #026-178 (S.L. & C.L.) Acquisition Date: 6/27/77  
Section 23 Township 5S, Range 4W

All Prime Farmland Units are used for Cropland.

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-196  
Section 23 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.


Consolidation Coal Company Property Tract # 026-196 (S.L. & C.L.)

Acquisition Date 8/28/78

An affidavit from the lessor was previously submitted concerning the pasture acreage.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-192  
Section 23 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-192 (S.L. & C.L.)

Acquisition Date 8/21/78


Brief Description:

The woodland areas are presently being logged.

An affidavit from the lessor was previously submitted concerning the pasture acreage.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer      2/4/86  
Soil Scientist      Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-120  
Section 23 Township 5S, Range 4W  
(SW $\frac{1}{4}$ )

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-120 (S & C)

Acquisition Date 12/29/72

Brief Description:

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

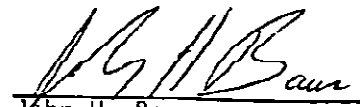
BGY-3K-101 dated 9/5/52 of Sections 22 & 23

BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer 2/4/86  
Soil Scientist Date



NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property #026-007, 026-086, 026-086A, 026-086B, 026-086C,  
Section 23 Township 5S, Range 4W 026-086D, 026-086E

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

<u>Consolidation Coal Company Property Tract #</u>	<u>Acquisition Date</u>
026-007	3/14/57
026-086A	10/28/71
026-086B	10/27/71
026-086C	11/2/72
026-086D	11/3/71
026-086E	11/2/71

**Brief Description:**

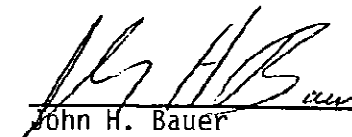
With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer 2/4/86  
Soil Scientist Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-120  
Section 23 Township 5S, Range 4W  
(SE $\frac{1}{4}$ )

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-120 (S & C)

Acquisition Date 12/29/72

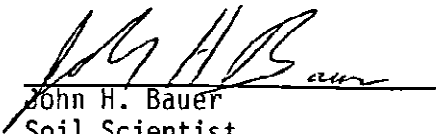
With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-067  
Section 26 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-067 (S.L. & C.L.)

Acquisition Date 12/5/67

Brief Description:

Homestead, presently rented.

Township Road through the center and west edge of the property.

Trees of various sizes adjacent to a creek in southern corner of property.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist  
2/4/86 Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-120A  
Section 26 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-120A

Acquisition Date 12/29/72

**Brief Description:**

Abandoned homestead used for storage of farm equipment and feeding cattle.

Abandoned township road on northern edge of property, presently used as field road.

A strip of land approximately 100' wide along a drainage way with various sizes of trees, presently used as pasture.

An area less than an acre in size in the south east corner of the property at the head of a drainage way, presently used as pasture.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist  
2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-033  
Section 26 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-033 (S. & C.)

Acquisition Date 2/19/49


Brief Description:

Non-cropland areas are adjacent to Bonnie Creek.

These areas have trees of various sizes along the creek bank, many large enough for logging.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/21/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-017, 026-089A, 026-089B  
Section 26 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.


Consolidation Coal Company Property Tract # 026-017 (C) Acq. Date: 7/12/68  
Acquisition Date \_\_\_\_\_ 026-089A(S) 10/31/69  
026-089B(S) 10/31/69

**Brief Description:**

Abandoned township road on southern edge of property, presently used as field road.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer 2/4/86  
Soil Scientist Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-017, 026-075  
Section 26 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-017(C) Acq. Date: 7/12/68

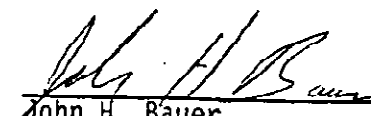
Acquisition Date \_\_\_\_\_ 026-075(S) 9/10/69

Brief Description:

Abandoned township road on southern edge of property, presently used as field road.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer 2/11/86  
Soil Scientist Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-017, 026-089  
Section 26 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-017 (C) Acq.Date: 7/12/68

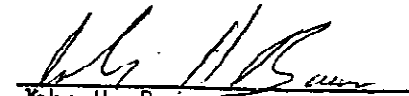
Acquisition Date \_\_\_\_\_ 026-089 (S) 9/10/69

Brief Description:

Township road in south east corner of property.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date



NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-040  
Section 26 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-040 (S & C)

Acquisition Date 2/1/49

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:


BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952, with the following exceptions:

5.4 acres of soil mapping unit 108  
0.3 acres of soil mapping unit 382

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86 Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-031  
Section 26 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-031 (S & C)

Acquisition Date 6/8/49

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952, with the following exceptions:

5.3 acres of soil mapping unit 108  
5.6 acres of soil mapping unit 382

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/14/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-020  
Section 26 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-020 (S & C)

Acquisition Date 11/27/48


Brief Description:

Abandoned homestead.

Township road on east edge of property.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/14/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-017  
Section 26 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.


Consolidation Coal Company Property Tract # 026-017 (C) Acq. Date 7/12/68  
062-089A (S) 10/31/69  
Acquisition Date \_\_\_\_\_ 026-089B (S) 10/31/69

Brief Description:

Township road on western edge of property.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist  
2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-067  
Section 26 Township 5S, Range 4W  
(NW $\frac{1}{4}$ , NW $\frac{1}{4}$ )

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-067 (S & C)

Acquisition Date 12/5/67

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:


BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952, with the following exceptions:

3.3 acres of soil mapping unit 382

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist  
2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-034  
Section 26 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-034 (S & C)

Acquisition Date 1/25/49

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

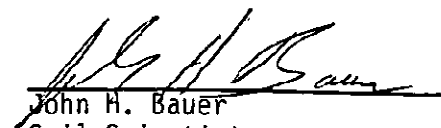
BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952, with the following exceptions:

1.5 acres of soil mapping unit 382

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-192  
Section 27 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-192 (S.L. & C.L.)


Acquisition Date 8/21/78

Brief Description:

The woodland areas are presently being logged.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-020  
Section 27 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-020 (S & C)

Acquisition Date 11/27/48

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date



NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-172  
Section 27 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-172 (S & C)

Acquisition Date 7/19/77

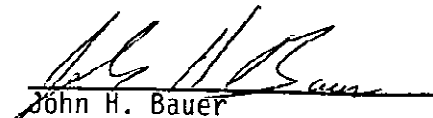
With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-025  
Section 27 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-025 (S & C)

Acquisition Date 2/1/49

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

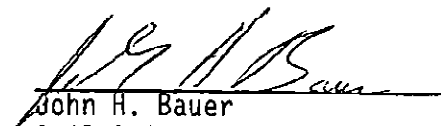
BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952, with the following exceptions:

28.6 acres of soil mapping unit 382

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-047  
Section 27 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-047 (S & C)

Acquisition Date 9/12/47

**Brief Description:**

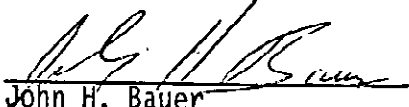
Non-cropland areas are adjacent to Bonnie Creek and/or adjacent to drainage ditches which flow into Bonnie Creek.

These areas have trees of various sizes, many large enough for logging.

Also, a township road borders the western property edge.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/10/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-026  
Section 34 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-026 (S & C)

Acquisition Date 3/18/49

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

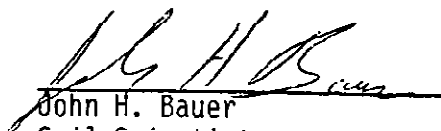
BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35


These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952, with the following exceptions:

4.3 acres of soil mapping unit 382

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-022  
Section 34 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-022 (S & C)

Acquisition Date 6/8/49

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952, with the following exceptions:

1.2 acres of soil mapping unit 108

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-211, 026-103, 026-205  
Section 34 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

<u>Consolidation Coal Company</u>	<u>Property Tract #</u>	<u>Acquisition Date</u>
	026-211	11/16/81
	026-103	12/6/48
	026-205	4/19/68


With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/8/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-055 (S & C), 026-205 (S & C) (Quitclaim Deed)  
Section 34 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-056 & 026-205

Acquisition Date 6/28/47 & 4/19/68


With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # Jamestown  
Section 34 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

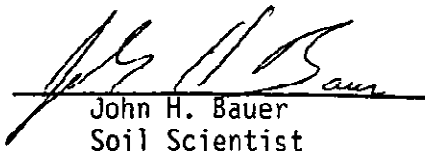
With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist  
2/4/86 Date



NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-097  
Section 35 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-097 (S.L. & C.L.)

Acquisition Date 5/1/70

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

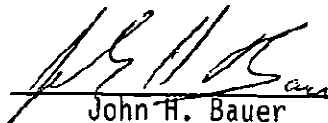
BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952, with the following exceptions:

2.1 acres of soil mapping unit 108.  
An on-site investigation was conducted on 1/28/86 with Gene A. Smout (academic training-forestry) and myself present. We concluded that the exception acreage above may have been historically used as cropland prior to acquisition.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-096 & 026-056  
Section 35 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-096 (S) Acq. Date: 5/1/70  
Acquisition Date \_\_\_\_\_ 026-056 (C) 6/28/47

Brief Description:

Abandoned homestead.

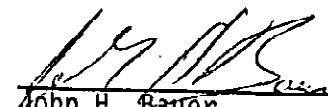
Township road on north side on property.

Fence row along eastern edge of property.

Trees of various sizes along railroad and drainage way adjacent to soil mapping unit 8E in south east corner of the property.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist  
2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-091  
Section 35 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-091 (S & C)

Acquisition Date 4/8/71

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

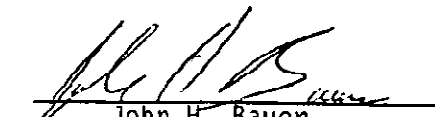
BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952, with the following exceptions:

4.7 acres of soil mapping unit 382.  
An on-site investigation was conducted on 1/28/86 with Gene A. Smout (academic training-forestry) and myself present. We concluded that the exception acreage above may have been historically used as cropland prior to acquisition.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-044  
Section 35 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-044 (S & C)

Acquisition Date 4/16/49

With the cooperation of the Perry County SCS office, the following aerial photos were obtained and reviewed:

BGY-3K-101 dated 9/5/52 of Sections 22 & 23  
BGY-3K-149 dated 9/5/52 of Sections 26, 27, 34, & 35

These photos indicate that the prime farmland soil mapping units currently not used for cropland were also not used for cropland in 1952.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

NEGATIVE DETERMINATION AFFIDAVIT

RE: Burning Star No. 4 Mine  
North/East Field  
Permit Application #152  
Consol Property # 026-072  
Section 35 Township 5S, Range 4W

The following property contains prime farmland soil mapping units not historically used for cropland 1783.27(b)(1). A request for negative determination is made per 1783.27(c). Refer to Attached Soil Map (Map C) for location of these areas.

Consolidation Coal Company Property Tract # 026-072 (S & C)

Acquisition Date 10/25/49

Brief Description:

Trees of various sizes adjacent to railroad property.  
Entire area less than an acre in size.

Based on the above information and my personal experience, I, John H. Bauer, hereby affirm on behalf of Consolidation Coal Company, that this property contains prime farmland soil mapping units which are not presently being used as cropland and do not meet the following definition for areas historically used for cropland.

Historically used for cropland means lands that have been used for cropland for any 5 years or more out of the 10 years immediately preceding the acquisition, including purchase, lease, or option, of the lands for the purpose of conducting or allowing through resale, lease or option, the conduct of surface coal mining and reclamation operations;

  
John H. Bauer  
Soil Scientist

2/4/86  
Date

Average difference between upstream and downstream locations is slight excepting TDS level. Raw water quality data for the above sites are tabulated and summarized in Part V, Question 10.

- F. Identify the general land uses of the watersheds upstream of the proposed mining area and many potential pollution sources which could significantly affect the steam quality at the mine area.

Upstream of the proposed permit area along Galum Creek the general land uses include: active mining, previous mining, cropland, woodland and pasture. Along Bonnie Creek upstream of the permit area land uses include: cropland, woodland and pasture. During heavy rainfall periods, erosion from cropland upstream may cause high levels of total dissolved and suspended solids. Since all runoff from the proposed permit area will be passed through sediment control structures while the area is being affected, no pollution from this source is expected to be contributed by the mine area. However, some increases over the current level in TDS and sulfate may occur downstream of the proposed mine area along Galum Creek.

- G. List all public water supplies within 10 miles of the proposed permit boundaries.

Several surrounding communities utilize Pennsylvanian sandstone strata as a water supply. The locations and pumpage data on the wells are shown in Table 3.

TABLE 3

Public Water Supplies Within  
10 Mile Radius

County	Municipality	Well#	Location	Depth	1981 Pumpage
Perry	Cutler	1	6S, 4W, Sec.5	550	0
	Cutler	2	6S, 4W, Sec.5	575	20,000 GPD
	Cutler	3	6S, 4W, Sec.5	595	20,000 GPD
Randolph					
	Percy	1	6S, 5W, Sec.11	427	45,000 GPD
	Percy	2	6S, 5W, Sec.11	430	42,000 GPD
	Sparta		5S, 5W, Sec.6	N/A	571,375 GPD
	Steeleville	1	6S, 5W, Sec.16	285	41,000 GPD
	Steeleville	2	6S, 5W, Sec.16	319	0
	Steeleville	3	6S, 5W, Sec.16	319	63,000 GPD
	Steeleville	4	6S, 5W, Sec.16	314	27,000 GPD
	Steeleville	5	6S, 5W, Sec.16	335	47,000 GPD
	Steeleville	6	6S, 5W, Sec.16	335	36,500 GPD

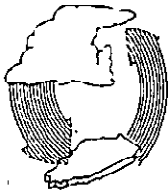
Date of Sample:	Monitoring Well		Schedule B
Designated # (shown on map)	MW-4-5		
Ownership: Name Address	Consolidation Coal Company P. O. Box 218 Pinckneyville, IL 62274		
Legal Location	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , NW $\frac{1}{4}$ Sec. 22, T5S, R4W		
Ground elevation (MSL)	468.7		
Normal water elevation (MSL)	463.0		
Water bearing strata	Unconsolidated Materials		
Type and size of casing	4 in. PVC		
Type and capacity of pump	Submersible .10 gpm		
Pumping rate (gpm)/ drawdown (ft)	6.7 / 19.7		
Type of pipe	PVC		
Point of sampling	Well Discharge		
Water Quality: 6/6/84			
Calcium (mg/l)	180		
Iron (mg/l)	0.5		
Magnesium (mg/l)	14		
Manganese (mg/l)	0.14		
Sodium (mg/l)	200		
Zinc (mg/l)	0.02		
Chloride (mg/l)	70		
Fluoride (mg/l)	0.6		
Nitrate (mg/l)	13		
Sulfate (mg/l)	100		
Acidity (mg/l)	0		
Alkalinity (mg/l)	340		
Total hardness (mg/l as CaCO <sub>3</sub> )	496		
Total dissolved solids (ROE)	653		
Conductivity	1300		
Field pH	6.7		
Field temperature (°F)	13		

Date of Sample:	Monitoring Well	Schedule B
Designated # (shown on map)	MW-4D-1	
Ownership: Name Address	Consolidation Coal Company P. O. Box 218 Pinckneyville, IL 62274	
Legal Location	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , NE $\frac{1}{4}$ Sec. 4, T6S, R4W	
Ground elevation (MSL)	490 (TOPO)	
Normal water elevation <sup>2</sup> (MSL)	--	
Water bearing strata	Sandstone	
Type and size of casing	6" Steel	
Type and capacity of pump	Submersible	
Pumping rate (gpm)/ drawdown (ft)	--	
Type of pipe	Steel	
Point of sampling	--	
Water Quality: 6/6/84		
Calcium (mg/l)	110	
Iron (mg/l)	0.2	
Magnesium (mg/l)	2.1	
Manganese (mg/l)	0.11	
Sodium (mg/l)	240	
Zinc (mg/l)	0.02	
Chloride (mg/l)	100	
Fluoride (mg/l)	0.4	
Nitrate (mg/l)	1.5	
Sulfate (mg/l)	10	
Acidity (mg/l)	0	
Alkalinity (mg/l)	346	
Total hardness (mg/l as CaCO <sub>3</sub> )	288	
Total dissolved solids (ROE)	522	
Conductivity	1100	
Field pH	7.6	
Field temperature (°F)	19	



# State Water Survey Division

ENR



2204 Griffith Drive  
Champaign, Illinois 61820  
217/333-2210

Illinois Department of  
Energy and Natural Resources

July 1, 1985

Louis Meschede  
Consolidation Coal Co.  
12755 Olive Blvd.  
St. Louis, MO 63141

Dear Mr. Meschede:

Please find the enclosed information you requested on the village of Cutler, Perry County, and villages of Percy and Steelville, Randolph County.

A 1983 correspondence with your company indicated that these towns had water supply wells finished in Mississippian age rock formations, this was in error. The enclosed well log data indicate that they are in fact finished in Pennsylvanian age sandstones with some limestone.

If you have any questions or need further information, please feel free to call.

Sincerely,  
ILLINOIS STATE WATER SURVEY

Robert C. Kohlhasse  
Hydrology Assistant  
Phone: (217) 333-6800

RCK:bh  
Enclosures

## PART IV

### OPERATIONS PLAN

#### 1) Proposed Operations Procedures and Methods for the Mine Over Its Projected Life

Describe the type and method of mining procedures and proposed engineering techniques to be employed in the operation of the proposed mine. Describe the major equipment to be employed and how such equipment will be used in the different aspects of the mining operation. Provide an estimation of the annual coal production by tonnage once the mine is at full operational capacity.

The type and method of mining to be utilized at Burning Star No. 4 will be strip mining with draglines and truck haulage. The engineering techniques to be used will be consistent with recognized standard engineering practices.

The major mining equipment to be used will be a Bucyrus Erie 2570 dragline and a 1550 B. E. dragline. The auxiliary equipment will consist of vertical and horizontal overburden drills, coal drill, loading shovels, front-end loaders, haulage trucks, ranging in capacity from 100-180 tons, and hauled to the preparation plant.

Portions of the Burning Star No. 4 Mine will utilize a multiple seam surface mining operation. This operation will remove the Illinois #6 and #5 seams. The two seam operation will utilize draglines to uncover the #6 seam and a truck/shovel operation to remove the interval between the #6 and #5 seam. The coal will be transported to the preparation plant by truck haulage.

The #6 seam overburden will be drilled and shot using horizontal and vertical drills. The #6 overburden will then be removed utilizing Bucyrus Erie 2570 and 1550 draglines, consistent with standard single seam dragline mining practices for the area. The #6 coal will be loaded into 100 to 180 tons bottom dump trucks with a loading shovel and/or end loader for transportation to the washing facility.

The #6 coal loading operations will be followed by a vertical overburden drill which will drill the interval material between the #6 and #5 seam. After the interval material is shot, a Marion 201 mining shovel will load the interval material into 125 ton end dumps exposing the #5 coal seam. The interval material will be hauled to valleys in the #6 spoil, used to backfill inclines or hauled back into other locations of the pit. The exposed #5 seam will be loaded into 100 to 180 ton bottom dump truck by a loading shovel and/or end loader for transportation to the washing facility.

Scrapers will remove topsoil in advance of the mining operations and will be assisted by tractors to grub trees and brush where necessary. The topsoil will immediately be replaced where practical or stockpiled for later replacement.

Topsoil stockpiles will be designated as such by a sign of sufficient size to be easily read. Buffer zones will be marked with steel fence post painted yellow and survey flagging strung between post in critical areas.

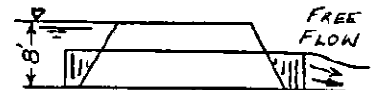
In addition to the utility corridor, two temporary creek crossing corridors are proposed in order to construct the Bonnie Creek Diversion. Creek crossing A is to be the primary crossing location with creek crossing B to be a secondary crossing that will only be constructed should field construction conditions require it. Proposed creek crossing locations A and B are located on the Mine Operations Map (Map D).

The creek crossings are designed to minimize the effects to Bonnie Creek. The structures will be able to handle flows of approximately 340 cfs. Should channel flows exceed this amount, they will flow out onto the adjacent floodplain—around the crossing location. The top of the creek crossings will be capped with rock to prevent their erosion. Please see the profile and cross section drawings of the creek crossing on the following page. Estimated flow capacity of the structure under "top of bank" flow conditions are calculated as follows:

From SCS Engineering Field Manual, Exhibits 3.9 & 3-12), For 60 Inch Diameter Corrugated Metal Pipe.

I. If the culverts are under inlet control conditions.

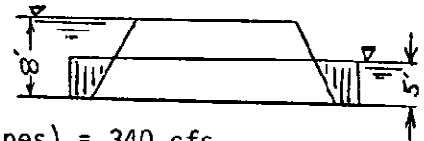
$$\begin{aligned} HW/D &= 8/5 = 1.6 \\ Q &= 220 \text{ cfs} \end{aligned}$$



$$\text{Total flow capacity} = 220 \text{ cfs (2 pipes)} = \underline{440 \text{ cfs}}$$

II. If the structure is under outlet control:

$$\begin{aligned} \text{Assume } H &= 3 \text{ feet} \\ Q &= 170 \text{ cfs} \end{aligned}$$

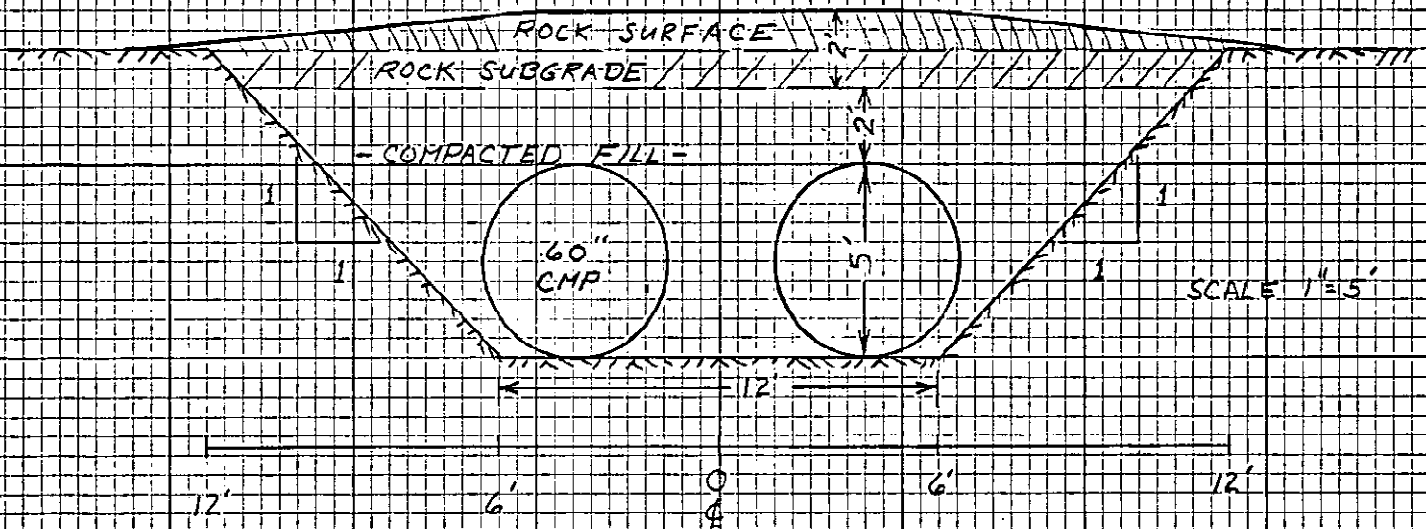
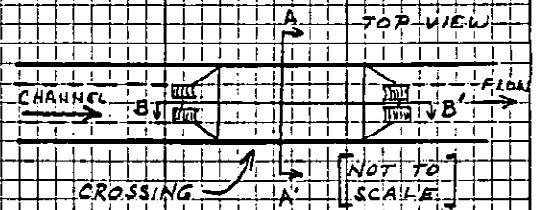


$$\text{Total flow capacity} = 170 \text{ cfs (2 pipes)} = \underline{340 \text{ cfs}}$$

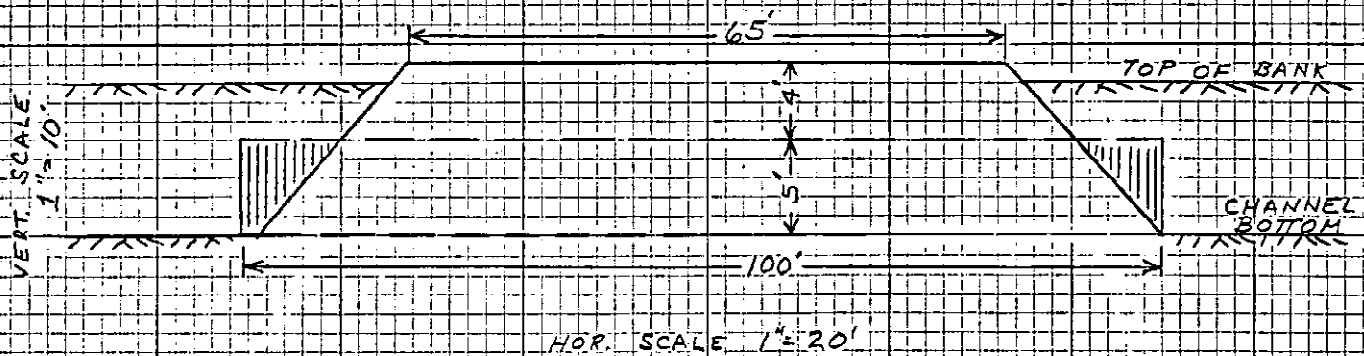
From the above estimates, the two - 60 inch culverts would be capable of passing flows within the channel at between 340 and 440 cfs.

# TEMPORARY BONNIE CREEK CROSSINGS

## PROFILE A-A'



## CROSS SECTION B-B'



In conjunction with the above design, we are requesting that the issuance of this permit constitute a buffer variance authorization specifically for the creek crossing and its associated service road.

Annual coal production at Burning Star #4 will be between 2.8 and 3.1 million tons depending on ratio.

2) Mining Operations Plan for the Proposed Permit Area

Describe the proposed mining operations plan for the permit area in terms of the mining sequence, the employment of facilities, establishment and maintenance of erosion control facilities, air pollution control facilities, coal storage, cleaning and loading areas, location and placement of topsoil spoil, coal waste, or other storage facilities.

Prior to disturbance, sedimentation ponds will be constructed to control surface runoff from areas affected by mining (with the exception of areas affected by roads only). Topsoil will be removed using scrapers and either spread over graded spoil or stockpiled. Consolidated overburden will be drilled and blasted, then spoiled by a dragline to expose the coal seam. Following coal removal, spoil will be graded with D-7, D-8 and D-9 bulldozers. Texture and topsoil will be replaced; then the area will be seeded with a permanent vegetative cover mix.

This proposed permit area does not include coal storage or preparation facilities or slurry disposal areas.

- A. Describe how each type of overburden (soil horizons, glacial drift and consolidated material) will be handled with regards to different types of mining equipment. What is the estimated pit width 120' ? If toxic materials have been identified as occurring in the overburden, describe how these materials will be handled to insure proper disposal.

Please refer to the above answer for discussion of sequence of overburden removal and machinery involved. No toxic material has been identified as occurring in the overburden.

5. Discuss the estimated life of each facility and how materials will be removed when the facility becomes inactive.

Roads will be either partially (to 30' wide) or wholly removed upon cessation of use. Material will be disposed of in the pit, and the areas will be graded and reclaimed as shown on Map E, Land Reclamation Plan.

- E. For structures other than buildings: Provide dimensions, construction material used and other information necessary to permit an estimate of demolition cost.

Not applicable; none proposed.

- F. Indicate location and size of buried volatile material storage facilities.

Not applicable; none proposed.

- G. Area closure or abandonment.

1. Describe all reclamation efforts to be expended to satisfy the requirements of abandonment. If an exemption request is to be made, it should be included.

A reduction to a 30' width of the haulroads will be completed one year after cessation of active use. The revegetation requirements and all reclamation plan details are located in Part V and on the Reclamation Plan Map.

- a) Include the timing to meet the final grading and revegetation requirements.
- b) Include a description of the final graded slopes, and the type of seed and seeding.
- c) Explain final coverage or treatment of toxic areas and locate all borrow pits.

Please refer to the mine operations map and Part V.

6. Waste Material

- A. Identify the nature of all waste material including non-coal waste to be disposed of within the permit area. Give the net neutralization potential.

Gob consists of reject coarse material, 5" x 1/4", pH of 4.4; it includes pyrites, rock, fire clay and other unmerchantable material. Neutralization potential is 220 tons  $\text{CaCO}_3$ /1000 tons gob.

# SEDIMENT POND DESIGN SURFACE DRAINAGE CONTROL

N.P.D.E.S. DISCH. NO.	TOTAL DRAINAGE AREA (AC)	TOTAL DISTURBED AREA (AC)	PIT PUMPAGE (GPM)	CALCULATED INFLOW FROM DESIGN STORM (AC-FT)	SEDIMENT STORAGE VOLUME (AC-FT)	TOTAL VOLUME BELOW P.S. ELEV. (AC-FT)	EMBANKMENT HEIGHT FROM UPSTREAM TOE TO E.S. (FT)
B.S.#4-9 (032) <sup>1</sup>	101	101	600	22.6	4.0	13.5	6.8
B.S.#4-9 (032) <sup>2</sup>	34	34	0	6.7	1.2	6.0	7.5
B.S.#4-9 (032A)	40	40	600	13.0	1.9	6.3	7
B.S.#4-9 (033)	580	580	1600	73.8	49.5	52.1	Pond Is Incised
B.S.#4-9 (034)	34 <sup>A</sup>	34	800	13.0	1.8	10.0	7
B.S.#4-9 (035)	153 <sup>A</sup>	153	1200	34.3	6.3	35.0	9
B.S.#4-9 (036)	28 <sup>B</sup>	28	2400	16.0	1.0	16.0	9
B.S.#4-9 (037)	34 <sup>C</sup>	34	1600	13.6	1.0	14.0	10.5

<sup>1</sup> Series Pond - Upstream Section

<sup>2</sup> Series Pond - Downstream Section

\*A 219 acres - Ponds (034) and (035) are designed to include pit pumpage from 219 acres (indicated as area A) on surface drainage control map. This area will be cut off by the advancing pit and can be transferred by pumps. Temporary pond "A" will be used as a temporary holding structure.

\*B 309 acres - Pond (036) is designed to include pit pumpage from 309 acres (indicated as area B) on surface drainage control map. This area will be cut off by the advancing pit and can only be transferred by pumps. Temporary ponds "B" and "C" will be used as temporary holding structures.

\*C 289 acres - Ponds (037) and (038) are designed to include pit pumpage from 289 acres (indicated as area C) on surface drainage control map. This area will be cut off by the advancing pit and can only be transferred by pumps.

214 acres - Acres permitted for diversion location or areas not affected by mining and not tributary to sediment ponds

2,088 acres

**SEDIMENT POND DESIGN  
SURFACE DRAINAGE CONTROL**

N. P. D. E. S. DISCH. NO.	TOTAL DRAINAGE AREA (AC)	TOTAL DISTURBED AREA (AC)	PIT PUMPAGE (GPM)	CALCULATED INFLOW FROM DESIGN STORM (AC-FT)	SEDIMENT STORAGE VOLUME (AC-FT)	TOTAL VOLUME BELOW P.S. ELEV. (AC-FT)	EMBANKMENT HEIGHT FROM UPSTREAM TOE TO E.S. (FT)
B.S.#4-9 (038)	53 <sup>C</sup>	53	1600	17.3	1.0	17.3	8



### Sediment Pond Design Summary

Sedimentation structures for the North Field - East will be constructed in a timing sequence necessary to control drainage from affected areas. To initially control affected area drainage, two ponds, (032) and (033) will be constructed. In conjunction with these two ponds, drainage ditch A will be constructed to direct unaffected acreage around affected areas. A drainage ditch B will be constructed to carry affected drainage to pond (033) once the advancing pit mines through the confluence location of the former Galum and Bonnie Creek Channels.

As the pit advances through ditch B, ditches C, A-1 and A-2 will be constructed. Ditch C will intercept drainage from additional affected area (identified as "Phase II" on the Surface Drainage Control Plan Map) and direct these flows to pond (033). Ditch A will be extended north with sections A-1 and A-2 and will continue to transfer unaffected acreage around affected areas. In addition, pond (038) will be constructed to treat affected along the north permit boundary.

As pit advancement proceeds through unaffected drainage ditch A, interior field drainage [ except that tributary to ponds (034) and (035) ] is confined within the permit boundaries and cannot naturally flow to a discharge point. Ponds (034), (035), (036), (037) and (038) are designed to receive pumped inflows from the interior field. Temporary holding pond A will direct runoff back to pond (035), while temporary holding ponds B and C will drain back to sump locations where water can be pumped to pond (036). Similarly, ditches I, J and K will be used to drain water from in front of the pit to sumps where it can be removed.

Ditch spoil from ditch H and A will be graded to slopes 2.5H:1V or flatter. In addition, all slopes will be seeded and mulched after grading. All spoil over 10 feet in height after grading will be terraced and have rock grouted or piped downdrains into the ditch channels.

Departmental approval will be requested prior to routing drainage through ditches A & H.

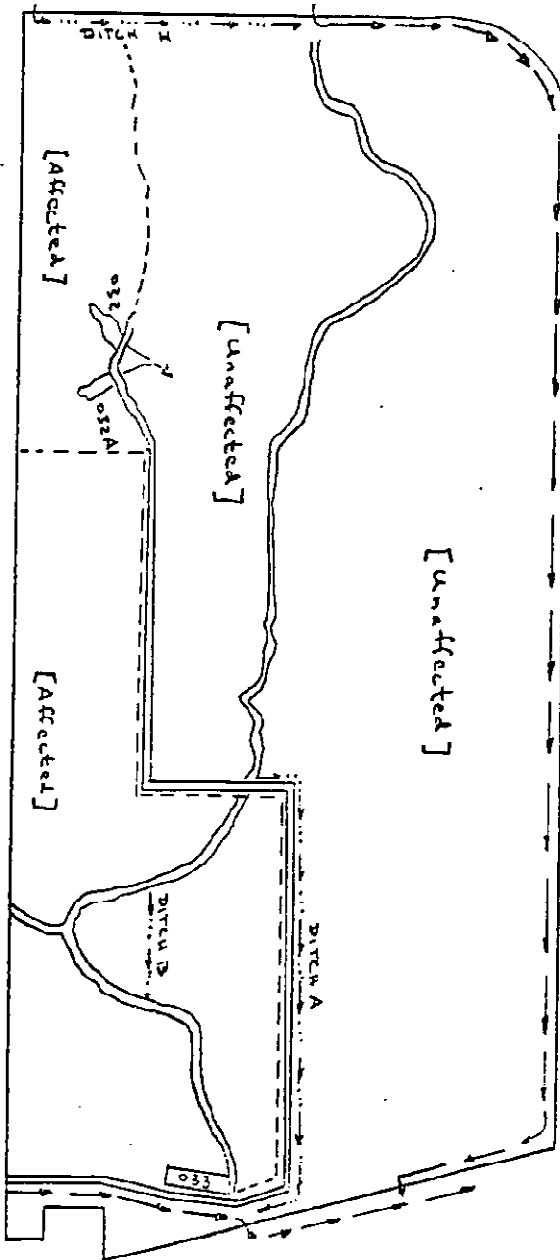
Service roads are utilized throughout the drainage control plan to control and separate drainage. At times, these roads may be utilized to convey flows on temporarily store runoff. Attached are drawings depicting the sequencing of the drainage control plan.

# Phase I

Western drainage controlled by Ponds (032) and (033). Ditch B connects upper channel with lower sections of Pond (033).

Eastern drainage transferred around affected area by ditch A.

The upstream watershed for ditch A is cutoff by ditch H or the Bonnie Creek diversion. The tributary area to ditch A is identified here as unaffected.



## Legend

- Service Road
- Drainage Ditch
- Creek Channel
- Channel Diversion
- Drainage Boundary
- Sediment Pond

**CONSOLIDATION  
COAL CO.**

TITLE

DRAWN BY

DRAWING NO.

CHK'D BY

SEDIMENT POND BS 4-9 (032)  
Series Pond Upstream Section

I. Design Information

Storm Event: 10 yr/24 hr  
Precipitation: 4.9 inches  
Drainage Area: 101.4 Acres  
Hydrologic Group: A  
Runoff Curve No.: 75  
Pit Pumpage: 600 gpm

II. Design Volumes

Conversion of Pit Pumpage:

$$(600 \text{ gpm}) / (45.2 \text{ gpm/ac}) = 13.3 \text{ ac}$$

Storm Runoff Volume:

$$(101.4 \text{ ac} + 13.3 \text{ ac})(0.083 \text{ ac-ft/ac}) = 9.52 \text{ ac-ft}$$

Sediment Storage Volume:

$$(101.4 \text{ ac} + 13.3 \text{ ac})(0.035 \text{ ac-ft/ac}) = \underline{4.01 \text{ ac-ft}}$$

$$\text{Total Design Storage Volume} = 13.5 \text{ ac-ft}$$

Minimum Required Surface Area:

$$\begin{aligned} (114.7 \text{ ac})(448 \text{ ft}^2/\text{ac}) &= 51,386 \text{ ft}^2 \\ &= 1.18 \text{ acres} \end{aligned}$$

III. Pond Sizing

From elevation versus storage volume graph (following page), a cross valley impoundment with a depth of 5.5 feet would have a storage volume of 13.5 acre-feet (13.5 ac-ft needed to meet design volume).

$$\text{Normal Pool Elevation} = 453.0 \text{ ft}$$

Surface Area:

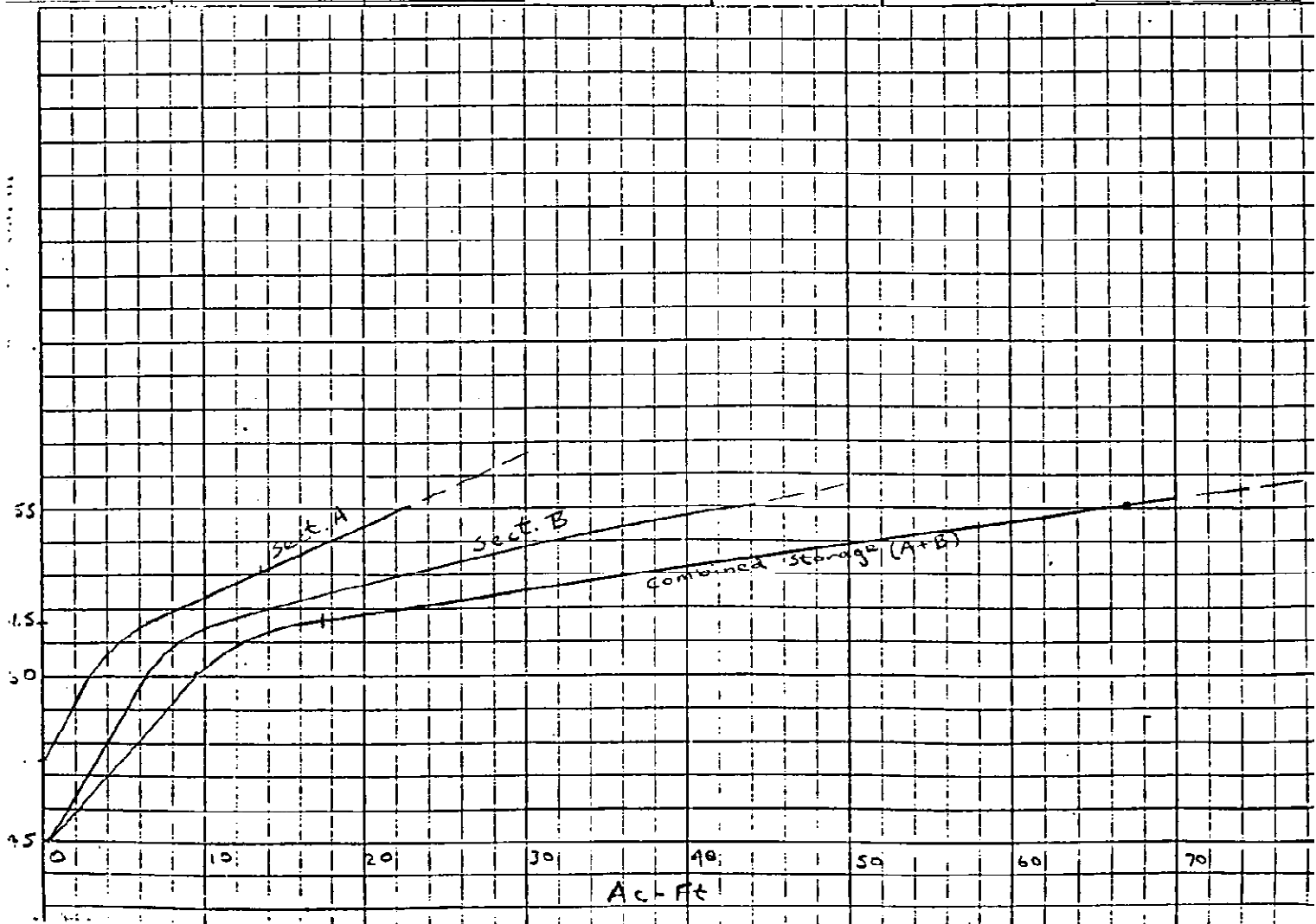
$$\text{Approximate surface area of pond is } 5.7 \text{ acres ( } 1.18 \text{ acres).}$$

# VOLUME CALCULATIONS

SITE BS-4-9(032) series

MAP SCALE: 1" = 400'

ELEVATION (ft.)	AREA (in. <sup>2</sup> )	AREA (acres)	AVERAGE AREA (acres)	DEPTH (ft.)	INCREMENTAL VOLUME (ac-ft)	TOTAL VOLUME (ac-ft)
Sec. A						
447.5	0	0				0
450	0.65	2.39	1.20	2.5	3.0	3.0
455	1.50	5.51	3.95	5	19.8	22.8
Sec. B						
442.5	0	0				0
445	0.09	0.33	0.17	2.5	0.4	0.4
450	0.57	2.09	1.21	5	6.1	6.5
455	3.53	12.97	7.53	5	37.7	44.2



#### IV. Spillway Sizing

CN = 75  
Slopes = Flat  
Precipitations = 4.9 inches  
Drainage Area = 114.7 acres

##### A. 10 yr/24 hr Storm

1. Total Runoff Volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, page 10.21;

Therefore, total runoff volume is

$$V_t = \frac{(114.7 \text{ acres})(2.36 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 22.6 \text{ ac-ft}$$

2. Peak Runoff Rate ( $Q_p$ )

From SCS Engineering Field Manual, Chapter 2,  
Page 2-59, Exhibit 2-10;

$$Q_p = 92 \text{ cfs}$$

##### B. 25 yr/24 hr Storm

Precipitation - 5.6 inches

1. Total Runoff Volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, Page 10.21;

Direct runoff from 5.6 inches rainfall is 2.94 inches.

$$V_t = \frac{(114.6 \text{ ac})(2.94 \text{ inches})}{12 \text{ in/ft}}$$

$$V_t = 28.1 \text{ ac-ft}$$

2. Peak Runoff Rate ( $Q_p$ );

From SCS Engineering Field Manual, Chapter 2,  
Page 2-65, Exhibit 2-10;

$$Q_p = 115 \text{ cfs}$$

C. Primary Spillway (for 10 yr/24 hr Storm)

From the elevation versus storage volume graph for pond (032, a cross valley impoundment with a depth of 5.5 feet would have a storage volume of 13.5 ac-ft.

Normal Pool Elevation = 453.0 ft = 13.5 ac-ft

Emergency Spillway Elevation = 454.3 ft = 19 ac-ft

Storage volume during 10 yr./24 hr. design storm ( $V_t$ ) is

$$V_s = 19 \text{ ac-ft} - 13.5 \text{ ac-ft} = 5.5 \text{ ac-ft}$$

$$\text{Total Inflow } (V_t) = 22.6 \text{ ac-ft}$$

$$\text{Peak Inflow } (Q_p) =$$

$$\frac{V_s}{V_t} = \frac{5.5}{22.6} = 0.24$$

Utilizing the Preliminary Hydraulic System Sizing Curve, from D'Appolonia Consulting Engineer's Engineering and Design Manual Coal Refuse Disposal Facilities, page 6.201;

$$\frac{Q_o}{Q_p} = 0.70$$

$$Q_{\text{out}} = (92 \text{ cfs})(.70)$$

$$Q_{\text{out}} = 64.4 \text{ cfs}$$

From the Drop Inlet Calculations on the following page,(2) 36 inch drop inlets are adequate for the primary outlet.

D. Emergency Spillway

The emergency spillway must be adequate to handle the incremental flow above the 10 yr/24 hr. runoff flow.

$$\begin{array}{ll} 25 \text{ yr/24 hr storm} & 115 \text{ cfs} \end{array}$$

$$\begin{array}{ll} 10 \text{ yr/24 hr storm} & \underline{92 \text{ cfs}} \end{array}$$

$$\begin{array}{ll} \text{Difference} & 23 \text{ cfs} \end{array}$$

Using broad crested weir discharge rate to size spillway  
 $Q = CLH^{1.5}$

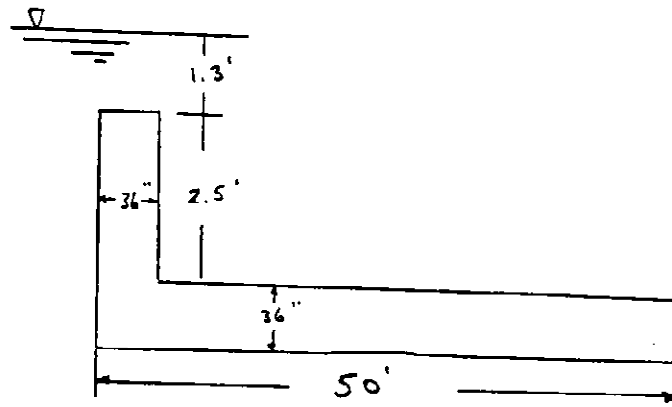
$$23 \text{ cfs} = 3.0 (L)(1)^{1.5}$$

$$23 \text{ cfs} = 3 (L)$$

$$\underline{L = 7.7 \text{ feet}}$$

## Drop Inlet Capacities:

Typical condition - 36 inch drop inlet



Orifice flow:

$$Q = c'a \sqrt{2gh}$$

$$h = 1.3'$$

$$g = 32.2 \frac{\text{ft}}{\text{sec}^2}$$

$$a = 36" \Rightarrow 7.07 \text{ ft}^2$$

$$c' = 0.6$$

1. Pipe area = 7.07 sq. ft.

$$Q = 0.6(7.07) \sqrt{2(32.2) 1.3}$$

$$= 38.8 \text{ cfs}$$

$$\frac{\times 2}{77.6 \text{ cfs}}$$

# HYDROLOGIC DATA

Design storm 10 yr / 24 hr  
 Precipitation amount 4.9 (in)  
 Drainage area 114.7 (acres)  
 Hydrologic soil group A

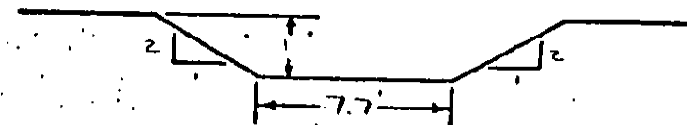
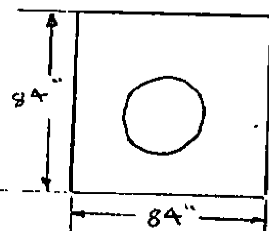
Curve number 75  
 Pit pumpage 600 (gpm)  
 Runoff volume 22.6 (ac-ft)

# IMPOUNDMENT DATA

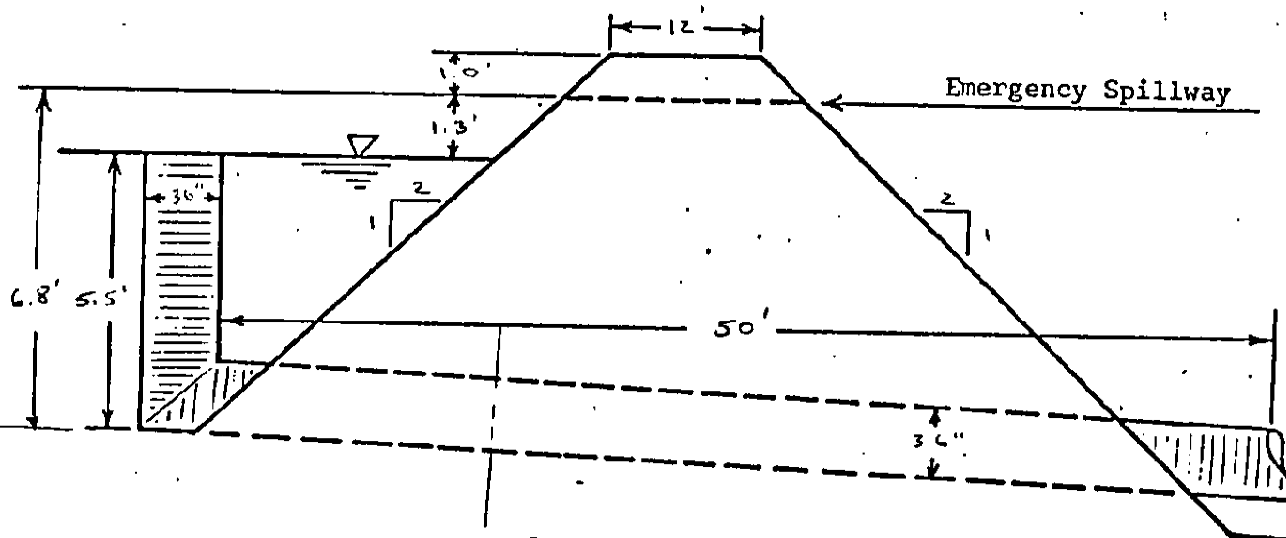
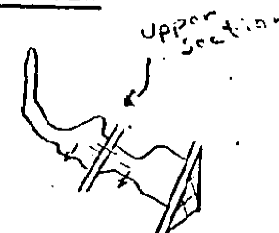
Sediment volume 4.01 (ac-ft)  
 Surface area at normal pool 5.7 (ac)  
 Volume at normal pool 13.5 (ac-ft)  
 Maximum depth at normal pool 5.5 (ft)

Anti-Seep Collar  
 Type: CMP  
 No. used: 1

EMERGENCY SPILLWAY - located (right)(left) side of dam looking downstream



# PLAN VIEW



Cross-Valley Pond  
 [Not to scale]

CONSOLIDATION COAL COMPANY  
 MIDWESTERN DIVISION  
 PINCKNEYVILLE, ILLINOIS 62274

# SEDIMENT POND DATA

DAM I.D. NO. 032

VINE	<u>B.S. 4</u>	DATE	<u>Aug. 7, 1985</u>
CHAD		SCALE	
APPD		DRAWING NO.	
DRAWN		SHEET OF	
		REV.	



SEDIMENT POND BS 4-9 (032)  
Series Pond Downstream Section

I. Design Information

Storm Event:	10 yr/24 hr
Precipitation:	4.9 inches
Drainage Area:	34.2 acres
Hydrologic Group:	A
Runoff Curve No.:	75
Pit Pumpage:	0 gpm

II. Design Volumes

Storm Runoff Volume:

$$(34.2 \text{ ac} +)(0.083 \text{ ac-ft/ac}) = \underline{2.84 \text{ ac-ft}}$$

Sediment Storage Volume:

$$(34.2 \text{ ac} +)(0.035 \text{ ac-ft/ac}) = \underline{1.20 \text{ ac-ft}}$$

$$\text{Total Design Storage Volume} = 4.04 \text{ ac-ft}$$

Minimum Design Surface Area:

$$(34.2 \text{ ac})(448 \text{ ft}^2/\text{ac}) = 15322 \text{ ft}^2$$

$$= 0.35 \text{ acres}$$

III. Pond Sizing

From elevation versus storage volume graph (Page IV-49), a cross valley impoundment with a depth of 5.5 feet would have a storage volume of 6 acre-feet (4.04 ac-ft needed to meet design volume).

$$\text{Normal Pool Elevation} = 450'$$

Surface Area:

Approximate surface area of pond is 7.6 acres ( .35 acres).

#### IV. Spillway Sizing

CN = 75  
Slopes = Flat  
Precipitations = 4.9 inches  
Drainage Area = 34.2 acres

##### A. 10 Yr/24 Hr Storm

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, page 10.21;

Therefore, total runoff volume is

$$V_t = \frac{(34.2 \text{ acres})(2.36 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 6.73 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ )

From SCS Engineering Field Manual, Chapter 2,  
Page 2-59, Exhibit 2-10;

$$Q_p = 42 \text{ cfs}$$

##### B. 25 Yr./24 Hr. Storm

Precipitation = 5.6 inches

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, Page 10.21;

Direct runoff from 5.6 inches rainfall is 2.94 inches.

$$V_t = \frac{(34.2 \text{ acres})(2.94 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 8.38 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ );

From SCS Engineering Field Manual, Chapter 2,  
Page 2-65, Exhibit 2-10;

$$Q_p = 53 \text{ cfs}$$

C. Primary Spillway (for 10 yr./24 hr. storm)

From the elevation versus storage volume graph for pond (032), a cross valley impoundment with a depth of 5.5 feet would have a storage volume of 13.5 ac-ft.

$$\text{Normal Pool Elevation} = 450.0' = 6 \text{ ac-ft}$$

$$\text{Allowable Pool Elevation Increase} = 452.0' = 14 \text{ ac-ft}$$

Storage volume during 10 yr/24 hr design storm ( $V_t$ ) is;

$$V_s = 14 \text{ ac-ft} - 6 \text{ ac-ft} = 8 \text{ ac-ft}$$

$$\text{Total Inflow } (V_t) = 8.38 \text{ ac-ft}$$

$$\text{Peak Inflow } (Q_p) =$$

$$\frac{V_s}{V_t} = \frac{8}{8.38} = 0.95$$

Utilizing the Preliminary Hydraulic System Sizing Curve, from D'Appolonia Consulting Engineer's Engineering and Design Manual Coal Refuse Disposal Facilities, page 6.201;

$$\frac{Q_o}{Q_p} = 0.03$$

$$Q_{\text{out}} = (53 \text{ cfs})(.03)$$

$$Q_{\text{out}} = 1.59 \text{ cfs}$$

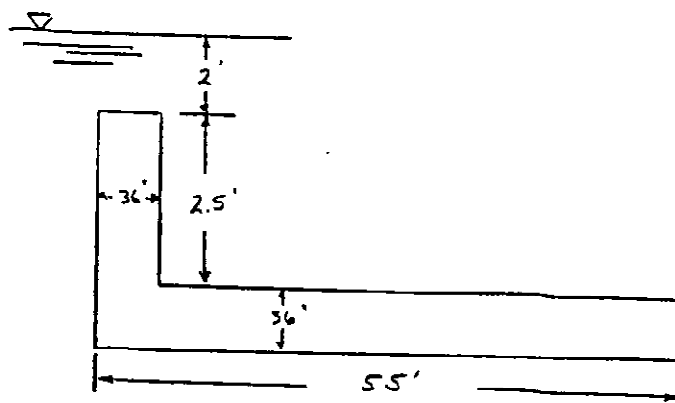
From the drop inlet calculations on the following page, (2) 36" drop inlets are adequate for the primary outlet.

D. Emergency Spillway

No emergency spillway is proposed. The drop inlets calculated should be sufficient for a 25 yr. storm.

# Drop Inlet Capacities:

Typical condition - 36 inch drop inlet



## Orifice flow:

$$Q = c'a \sqrt{2gh}$$

$$h = 2'$$

$$g = 32.2 \text{ ft/sec}^2$$

$$a = 36'' \quad 7.07 \text{ ft}^2$$

$$c' = 0.6$$

1. Pipe area = 7.07 sq.ft.

$$Q = .6(7.07) \sqrt{2(32.2)2}$$

Discharge from  
upstream dam

$$= 48.1 \text{ cfs}$$

$$Q_{\text{out}} = 1.59 + 66 \text{ cfs} + 23 \text{ cfs}$$

$$\frac{X \ 2}{96.3 \text{ cfs}}$$

$$= 89 \text{ cfs}$$

# HYDROLOGIC DATA

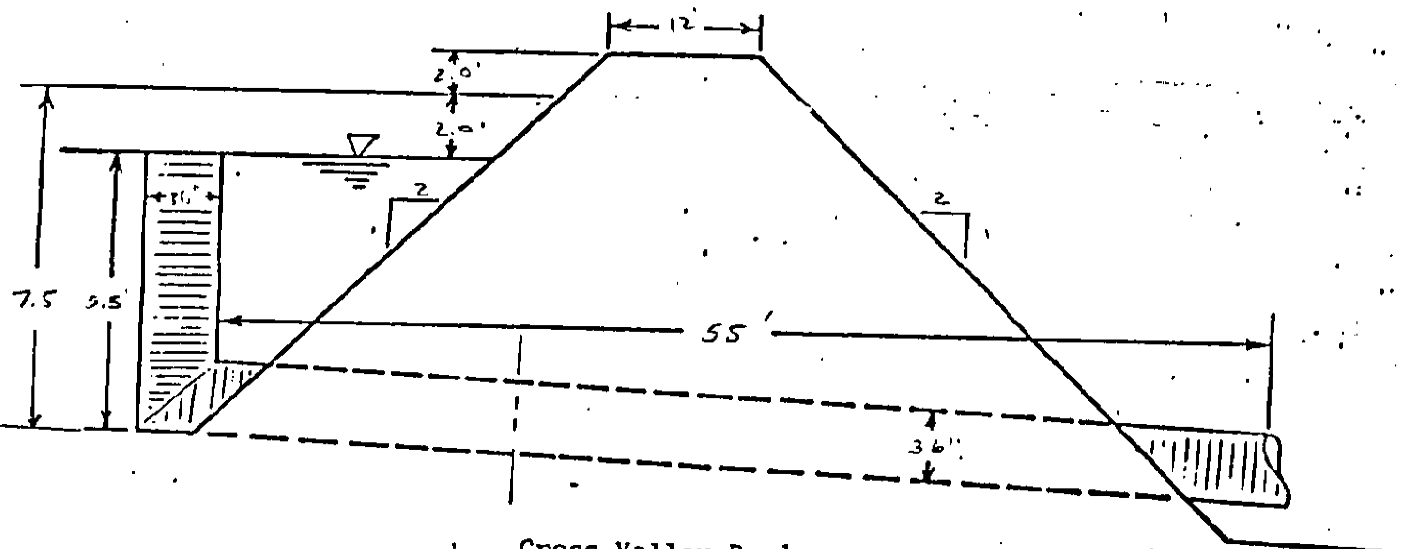
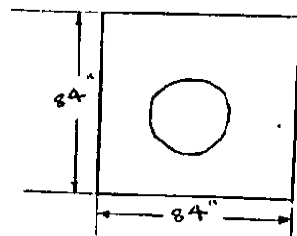
Design storm 10 yr / 24 hr.  
 Precipitation amount 4.9 (in)  
 Drainage area 34.2 (acres)  
 Hydrologic soil group A

Curve number 75  
 Pit pumpage 0 (gpm)  
 Runoff volume 8.38 (ac-ft)

# IMPOUNDMENT DATA

Sediment volume 1.2 (ac-ft)  
 Surface area at normal pool 7.6 (ac)  
 Volume at normal pool 6 (ac-ft)  
 Maximum depth at normal pool 5.5 (ft)

Anti-Seep Collar  
 Type: CMP  
 No. used: 1



# PLAN VIEW



Cross-Valley Pond  
 [Not to scale]

CONSOLIDATION COAL COMPANY  
 MIDWESTERN DIVISION  
 PINCKNEYVILLE, ILLINOIS 62770

# SEDIMENT POND DATA

DAM I.D. NO. \_\_\_\_\_

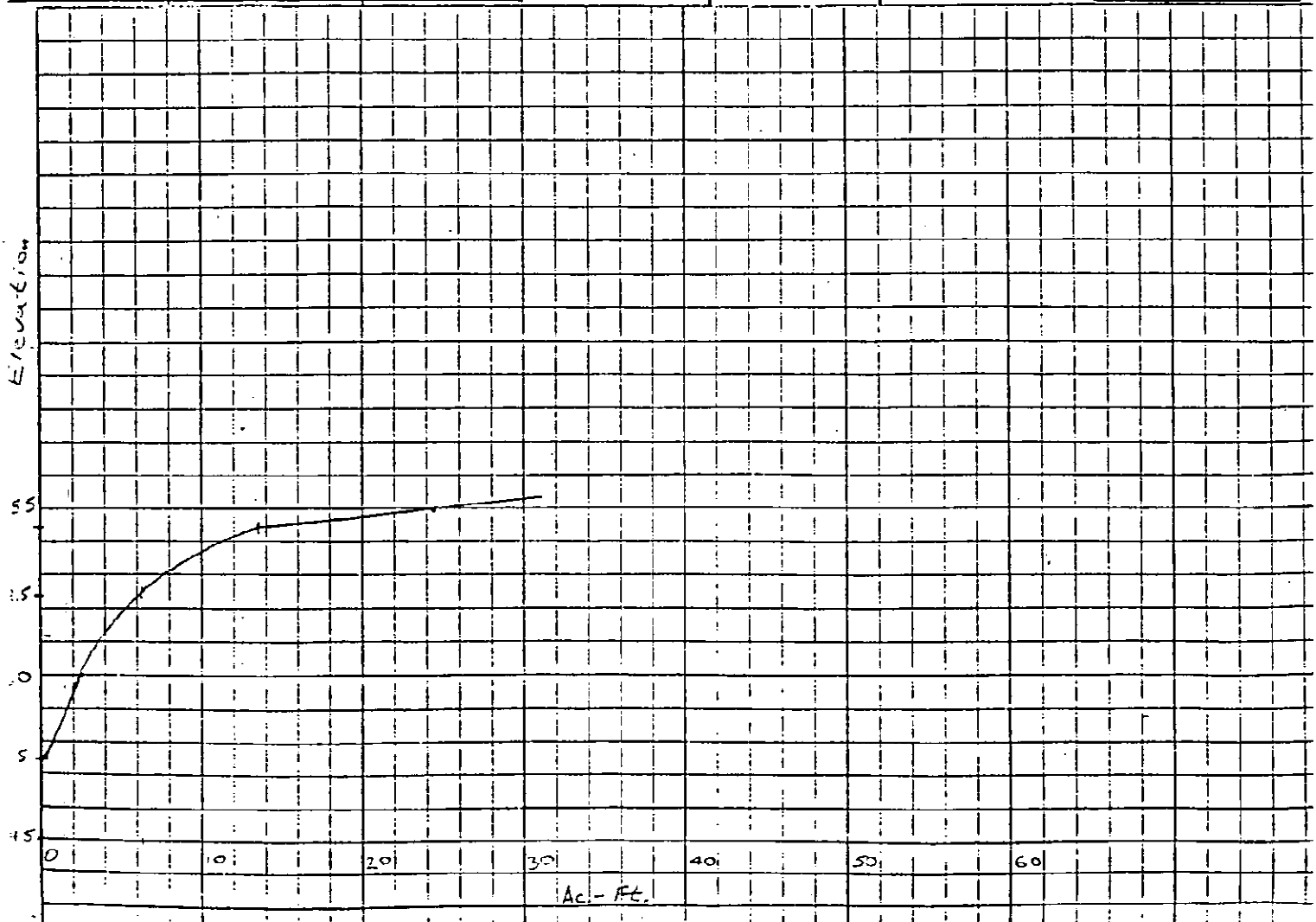
MINE	DATE
CHRD	SCALE
APPO	DRAWING NO.
DRAWN	REV.

# VOLUME CALCULATIONS

SITE B.S. # 4-9-032A

MAP SCALE: 1" = 400'

ELEVATION (ft.)	AREA (in. <sup>2</sup> )	AREA (acres)	AVERAGE AREA (acres)	DEPTH (ft.)	INCREMENTAL VOLUME (ac-ft)	TOTAL VOLUME (ac-ft)
447.5	0	0				0
450	.52	1.91	0.96	2.5	2.40	2.40
455	1.90	6.98	4.45	5	22.23	24.63



#### IV. Spillway Sizing

CN = 75  
Slopes = Flat  
Precipitations = 4.9 inches  
Drainage Area = 39.7 acres

##### A. 10 Yr/24 Hr Storm

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, page 10.21;

Therefore, total runoff volume is

$$V_t = \frac{(53 \text{ acres})(2.36 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 10.42 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ )

From SCS Engineering Field Manual, Chapter 2,  
Page 2-59, Exhibit 2-10;

$$Q_p = 56 \text{ cfs}$$

##### B. 25 Yr./24 Hr. Storm

Precipitation = 5.6 inches

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, Page 10.21;

Direct runoff from 5.6 inches rainfall is 2.94 inches.

$$V_t = \frac{(53 \text{ acres})(2.94 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 12.99 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ );

From SCS Engineering Field Manual, Chapter 2,  
Page 2-65, Exhibit 2-10;

$$Q_p = \underline{70 \text{ cfs}}$$

C. Primary Spillway (for 25 yr./24 hr. storm)

From the elevation versus storage volume graph for pond (032A), a cross valley impoundment with a depth of 5.0 feet would have a storage volume of 6.3 ac-ft.

$$\text{Normal Pool Elevation} = 452.5 = 6.3 \text{ ac-ft}$$

$$\text{Emergency Spillway Elevation} = 454.5 = 13.5 \text{ ac-ft}$$

Storage volume during 10 yr/24 hr design storm ( $V_t$ ) is;

$$V_s = 13.5 \text{ ac-ft} - 6.3 \text{ ac-ft} = 7.2 \text{ ac-ft}$$

$$\text{Total Inflow } (V_t) = 12.99 \text{ ac-ft}$$

$$\text{Peak Inflow } (Q_p) =$$

$$\frac{V_s}{V_t} = \frac{7.2}{12.99} = 0.55$$

Utilizing the Preliminary Hydraulic System Sizing Curve, from D'Appolonia Consulting Engineer's Engineering and Design Manual Coal Refuse Disposal Facilities, page 6.201;

$$\frac{Q_o}{Q_p} = 0.30$$

$$Q_{out} = (70 \text{ cfs})(0.30)$$

$$Q_{out} = 21 \text{ cfs}$$

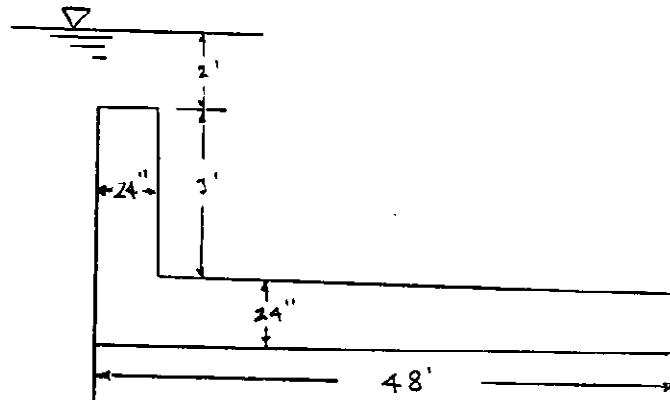
From the drop inlet calculations on the following page, a 24 inch drop inlet is adequate for the primary outlet.

Since the primary spillway is adequate to handle a 25 yr/24 hr storm, no emergency spillway is proposed.



# Drop Inlet Capacities:

Typical condition - 1/2 inch drop inlet



## Orifice flow:

$$Q = c' a \sqrt{2gh}$$

$c'$  = orifice coefficient  
 $g$  = acceleration of gravity  
 $a$  = cross-sectional area  
 $h$  = elevation head

1. Pipe area = 3.14 sq.ft.

$$\begin{aligned} Q &= 0.6(3.14) \sqrt{2(32.2)2} \\ &= 21.4 \text{ cfs} \end{aligned}$$

# HYDROLOGIC DATA

Design storm 10 yr / 24 hr.  
 Precipitation amount 4.9 (in)  
 Drainage area 37.7 (acres)  
 Hydrologic soil group A

Curve number 75  
 Pit pumpage 600 (gpm)  
 Runoff volume 10.4 (ac-ft)

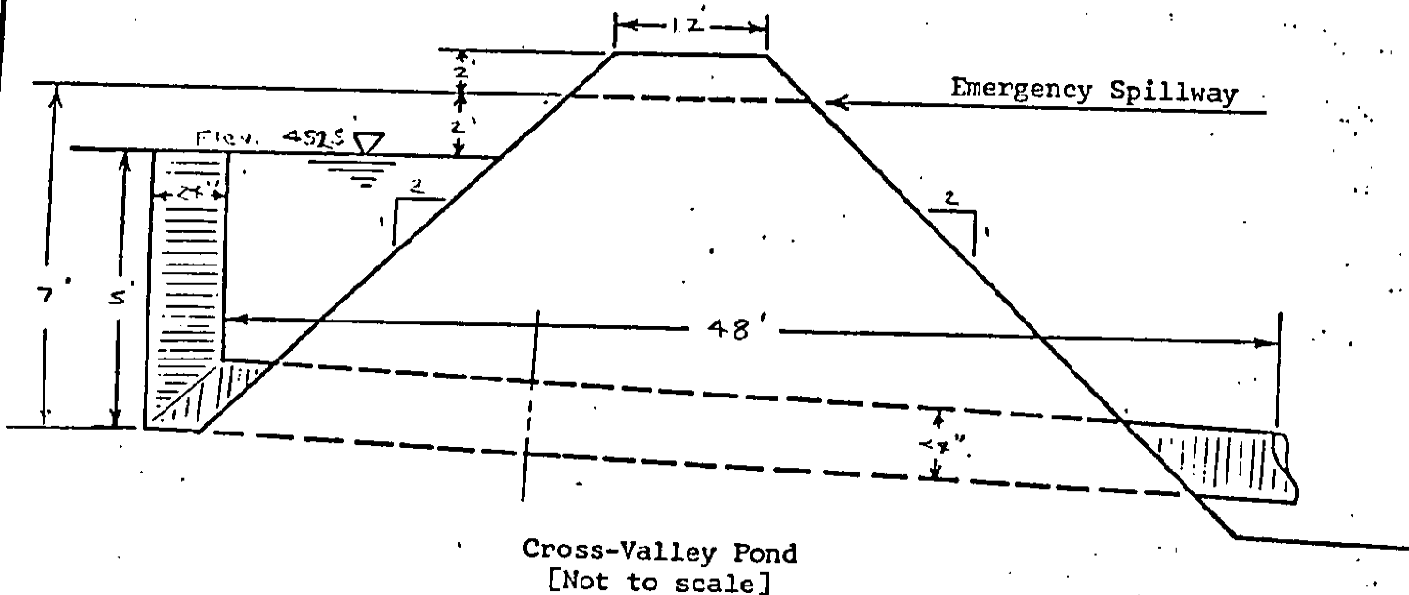
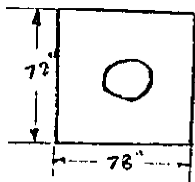
# IMPOUNDMENT DATA

Sediment volume 1.9 (ac-ft)  
 Surface area at normal pool 2.5 (ac)  
 Volume at normal pool 6.3 (ac-ft)  
 Maximum depth at normal pool 5.0 (ft)

## ANTI SEEP COLLARS

(E) No (if yes, locate below)

TYPE : CMP  
 NO. USED : 1



Plan View

CONSOLIDATION COAL COMPANY  
 MIDWESTERN DIVISION  
 PINEKNEYVILLE, ILLINOIS 62274

## SEDIMENT POND DATA

DAM I.D. NO. 032A

DATE	7-10-85	REV.	
CHKD		SCALE	NONE
APPD		DRAWING NO.	
DRAWN		SHEET OF	

The upstream and downstream dams of pond 032, will be constructed concurrently.

Galum Creek Channel Storage:

Due to the shallow gradient in this portion of the creek, the entire length will be maintained with an average depth of 9 feet.

$$\text{Volume} = (\text{Area}) \text{ Length}$$

$$\text{Volume} = \frac{30' + 52'}{2} (9) (3500 \text{ ft})$$

$$\text{Volume} = (369 \text{ ft}^2) (3500 \text{ ft})$$

$$\text{Volume} = 1,291,500 \text{ ft}^3$$

$$\text{Volume} = 29 \text{ ac-ft}$$

Bonnie Creek Channel Storage:

$$\text{Volume} = (\text{Area}) \text{ Length}$$

$$\text{Volume} = \frac{40' + 20'}{2} (8') (3100 \text{ ft})$$

$$\text{Volume} = (240 \text{ ft}^2)(3100 \text{ ft})$$

$$\text{Volume} = 744,000 \text{ ft}^3$$

$$\text{Volume} = 17.1 \text{ ac-ft}$$

$$\text{Total Storage Volume} = 29 + 17.1 = \underline{46.1 \text{ ac-ft}}$$

Additional incised volume required for pond (033):

$$\text{Volume} = (49.5 \text{ ac-ft}) - (46.1 \text{ ac-ft})$$

$$\text{Volume} = \underline{3.4 \text{ ac-ft}}$$

Due to Phase II additional incised volume requirements, pond (033) will be constructed with a pond volume of 10.30 ac-ft.

- Assume maximum depth of 8 feet
- Assume average width of 120 feet

$$\text{Area} = 120 \times 8 = 960 \text{ ft}^2$$

$$\text{Avg. Length} = \text{Volume} - \text{Area}$$

$$\text{Avg. Length} = (10.3 \text{ ac-ft})(43,560 \text{ ft}^3/\text{ac-ft}) - 960 \text{ ft}^2$$

$$\text{Avg. Length} = 467 \text{ ft.}$$

Construction Dimensions:

Top Width	-	135 ft	Top Length	-	485 ft
Bottom Width	-	105 ft	Bottom Length	-	450 ft

## SEDIMENT POND BS 4-9 (033)

### Phase II

#### I. Design Information

Storm Event: 10 yr/24 hr  
Precipitation: 4.9 inches  
Drainage Area: 326.6 acres  
Hydrologic Group: A  
Runoff Curve No.: 75  
Pit Pumpage: 2400 gpm

#### II. Design Volume

Conversion of Pit Pumpage:

$$(2400 \text{ gpm}) / (45.2 \text{ gpm/ac}) = 53 \text{ ac}$$

Storm Runoff Volume:

$$(290 \text{ ac} + 53 \text{ ac})(0.083 \text{ ac-ft/ac}) = 31.5 \text{ ac-ft}$$

Sediment Storage Volume:

$$(376.6 \text{ ac} + 53 \text{ ac})(0.035 \text{ ac-ft/ac}) = \underline{13.3 \text{ ac-ft}}$$

$$\text{Total Design Storage Volume} = 44.8 \text{ ac-ft}$$

Minimum Design Surface Area:

$$\begin{aligned} (379.6 \text{ ac})(448 \text{ ft}^2/\text{ac}) &= 170,061 \text{ ft}^2 \\ &= 3.9 \text{ acres} \end{aligned}$$

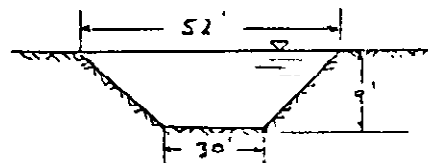
#### III. Pond Sizing

Pond (033) will remain on incised structure located in the Galum Creek bottoms. Its location is in the lowest drainage area within the permit boundaries and it will be separated from the temporary Galum Creek diversion by a service road levee.

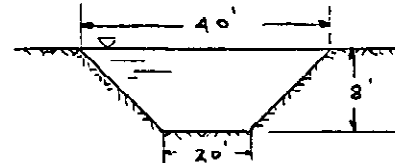
The existing channels will provide a portion of the treatment volume for pond (033). Service road crossings will be used to maintain adequate depths upstream from the incised pond.

## Channel Volumes:

### Typical Cross Section:



Galum Channel  
(1600 ft)



Bonnie Channel  
(2000 ft)

### Galum Channel Storage:

$$\text{Volume} = A (L)$$

$$\text{Volume} = \frac{52 \text{ ft} + 30 \text{ ft}}{2} (9 \text{ ft})(1600 \text{ ft})$$

$$\text{Volume} = 590,400 \text{ ft}^3$$

$$\text{Volume} = 13.5 \text{ ac-ft}$$

### Bonnie Channel Storage:

$$\text{Volume} = A (L)$$

$$\text{Volume} = \frac{40 \text{ ft} + 20 \text{ ft}}{2} (8) (2000')$$

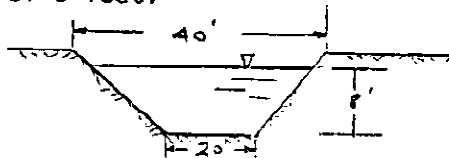
$$\text{Volume} = 480,000 \text{ ft}^3$$

$$\text{Volume} = 11 \text{ ac-ft}$$

### Phase II: (Bonnie Channel Storage)

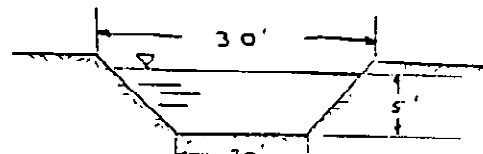
Channel Slope = Approx. 1 ft/1000 ft.

Upstream channel length of 2800 feet would result in an upper pool depth of 5 feet.



$$\text{Area} = \frac{40 + 20}{2} (8)$$

$$\text{Area} = 240 \text{ ft}^2$$



$$\text{Area} = \frac{20 + 30}{2} (5)$$

$$\text{Area} = 125 \text{ ft}^2$$

Total Channel Storage Volume:

$$\text{Volume} = 12.0 \text{ ac-ft} + 11.0 \text{ ac-ft} + 11.7 \text{ ac-ft}$$

$$\text{Volume} = 34.7 \text{ ac-ft}$$

Additional incised volume required for pond (033):

$$\text{Volume} = (44.8 \text{ ac-ft}) - (34.7 \text{ ac-ft})$$

$$\text{Volume} = \underline{10.1 \text{ ac-ft}}$$

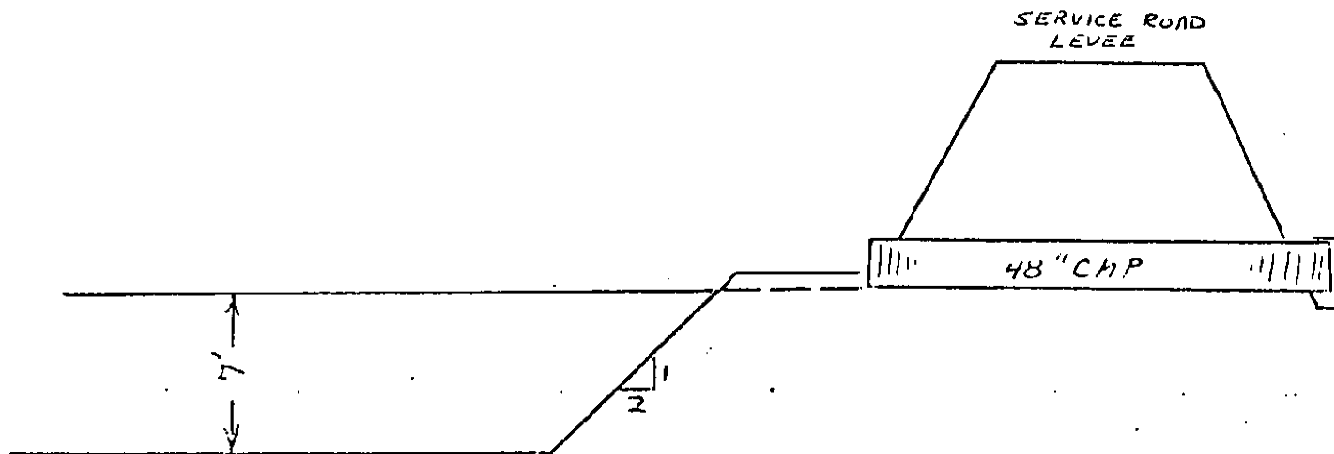
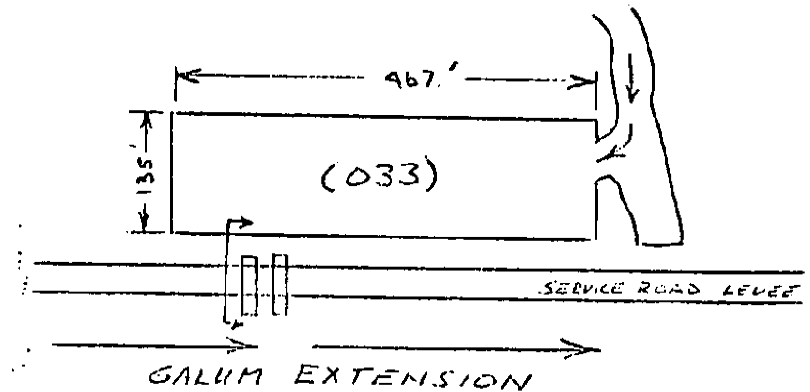
See Sediment Pond BS 4-9 (033), Phase I for pond (033) construction dimensions and outlet sizing.

# HYDROLOGIC DATA

Design storm 10 Yr. / 24 Hr.  
 Precipitation amount 4.9 (in) Curve number 75  
 Drainage area 385 (acres) Pit pumpage 1600 (gpm)  
 Hydrologic soil group A Runoff volume 73.8 (ac-ft)

# IMPOUNDMENT DATA

Sediment volume N/A (ac-ft)  
 Surface area at normal pool N/A (ac)  
 Volume at normal pool N/A (ac-ft)  
 Maximum depth at normal pool 7 (ft)



CONSOLIDATION COAL COMPANY  
 MIDWESTERN DIVISION  
 PINCKNEYVILLE, ILLINOIS 62274

## SEDIMENT POND DATA

DAM I.D. NO. 033

WIRE	BS No. 4	DATE	11-7-84
CHKD		SCALE	
APPD		DRAWING NO.	
DRAWN		SHEET OF	



C. Primary Spillway (for 25 yr./24 hr. storm)

From the elevation versus storage volume graph for pond (034, a cross valley impoundment with a depth of 5 feet would have a storage volume of 10 ac-ft.

Normal Pool Elevation = 443' = 10 ac-ft

Emergency Spillway Elevation = 445 = 18 ac-ft

Storage volume during 25 yr./24 hr. design storm ( $V_t$ ) is;

$$V_s = 18 \text{ ac-ft} - 10 \text{ ac-ft} = 8 \text{ ac-ft}$$

$$\text{Total Inflow } (V_t) = 13 \text{ ac-ft}$$

$$\text{Peak Inflow } (Q_p) =$$

$$\frac{V_s}{V_t} = \frac{8}{13} = 0.62$$

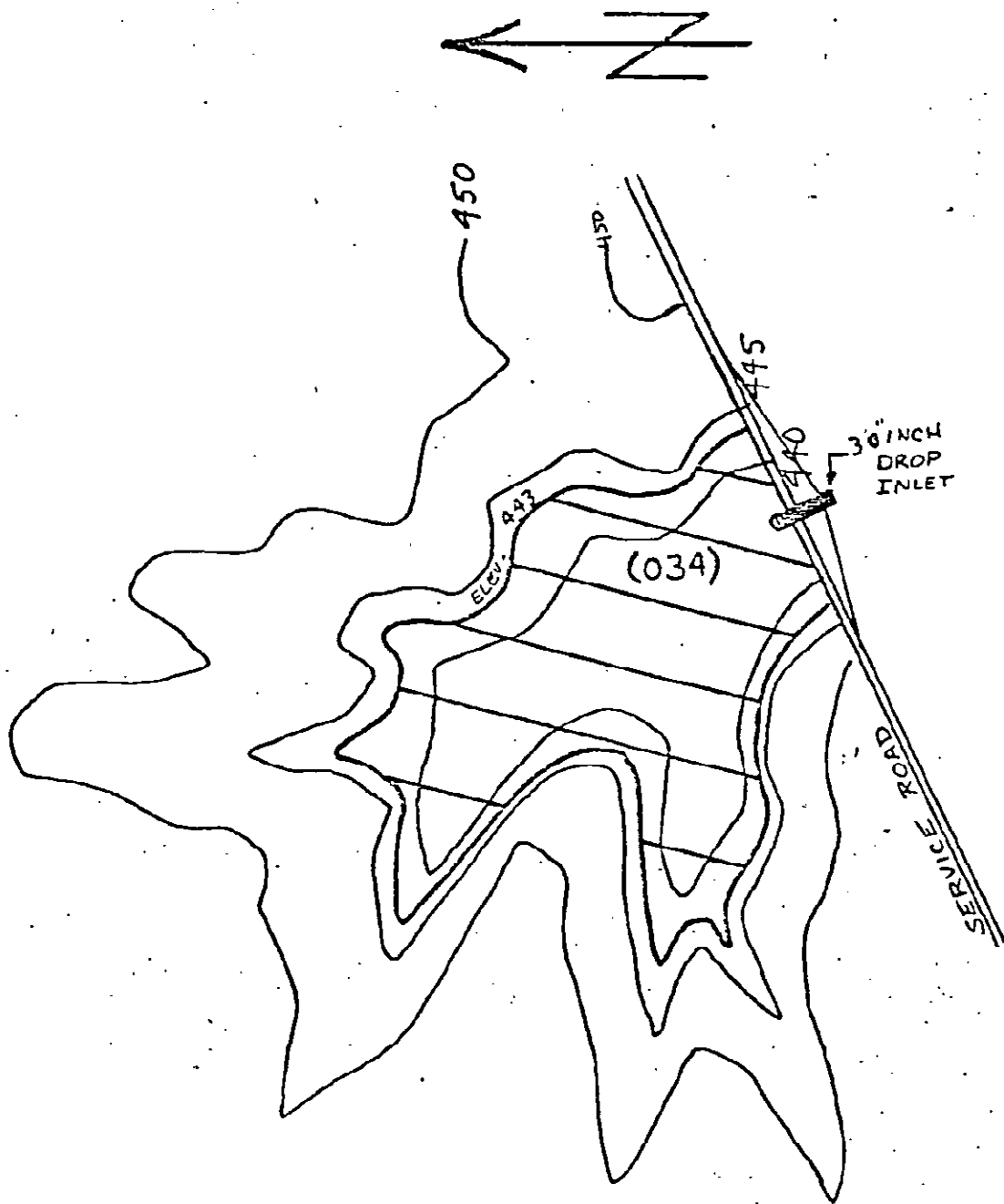
Utilizing the Preliminary Hydraulic System Sizing Curve, from D'Appolonia Consulting Engineer's Engineering and Design Manual Coal Refuse Disposal Facilities, page 6.201;

$$\frac{Q_o}{Q_p} = 0.22$$

$$Q_{out} = (110 \text{ cfs}) (0.22)$$

$$Q_{out} = 24 \text{ cfs}$$

From the drop inlet calculations on the following page, a 30" inch drop inlet is adequate for the primary outlet. No emergency spillway is proposed. The primary outlet is capable of handling a 25 yr. storm.



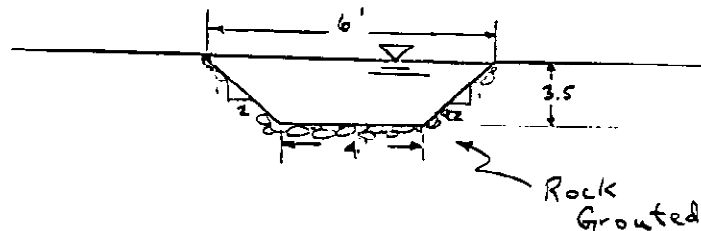
POND (034)  
1" = 200'

Using the Preliminary Hydraulic System Sizing Curve, from D'Appolonia Consulting Engineers' Engineering and Design Manual Coal Refuse Disposal Facilities, page 6.201;

$$\frac{Q_o}{Q_p} = 0.10$$

$$Q_{out} = ((0.10) 860) \\ = 86.0 \text{ cfs}$$

For the incline/final cut lake outlet, an open channel spillway is proposed. Below is a cross section for the structure.



For a flow depth of 3.5'

$$Q = CLH^{1.5} \\ = 3.0 \left( \frac{6 + 4}{2} \right) 3.5^{1.5} \\ = \underline{98 \text{ cfs}}$$

A CN of 70 for diversion ditch A is appropriate due to specific soil types at the Burning Star #4 Mine and tributary areas being nondisturbed by mining. From page IV-47, the average permeability of soil types in the field is 0.77 inches/hr. From Table A-10, page 544 of Design of Small Dams, U. S. Department of the Interior, soils types have the following 15 minute retention loss rates.

<u>Soil Type</u>	<u>15 Min. Retention Rate</u>	<u>1 hr. Retention Rate</u>
A	0.10	0.40
B	0.06	0.24
C	0.03	0.12
D	0.02	0.08

Thus, the soil types at B.S.#4 should fall under the soil type A classification. The unaffected drainage areas tributary to ditch A, consist mainly of forest, pasture and rowcrop. From the Design of Small Dams, U. S. Department of the Interior, page 536, these land uses should have the following C.N.'s.

Forest : 36  
 Pasture: 49  
 Rowcrop: 67

Thus using a C.N. of 70 for the channel designs is more than conservative enough for design purposes.

## Permanent Ditch H-1

Ditch H-1 will transport drainage from the northwest corner of Permit #152 to the northwestern most incline. Ditch H-1's tributary drainage is equal to 407.5 acres. From the SCS National Engineering Handbook, Section 4 Hydrology, Chapter 10, Page 10.21:

For 407.5 Acres, CN 75, 10 yr/24 hr storm, 4.9"

Q peak = 205 cfs

This ditch was designed for 205 cfs. Using Manning's Open Channel Flow Equation, where

$$n = 0.030$$

$$s = 0.0018$$

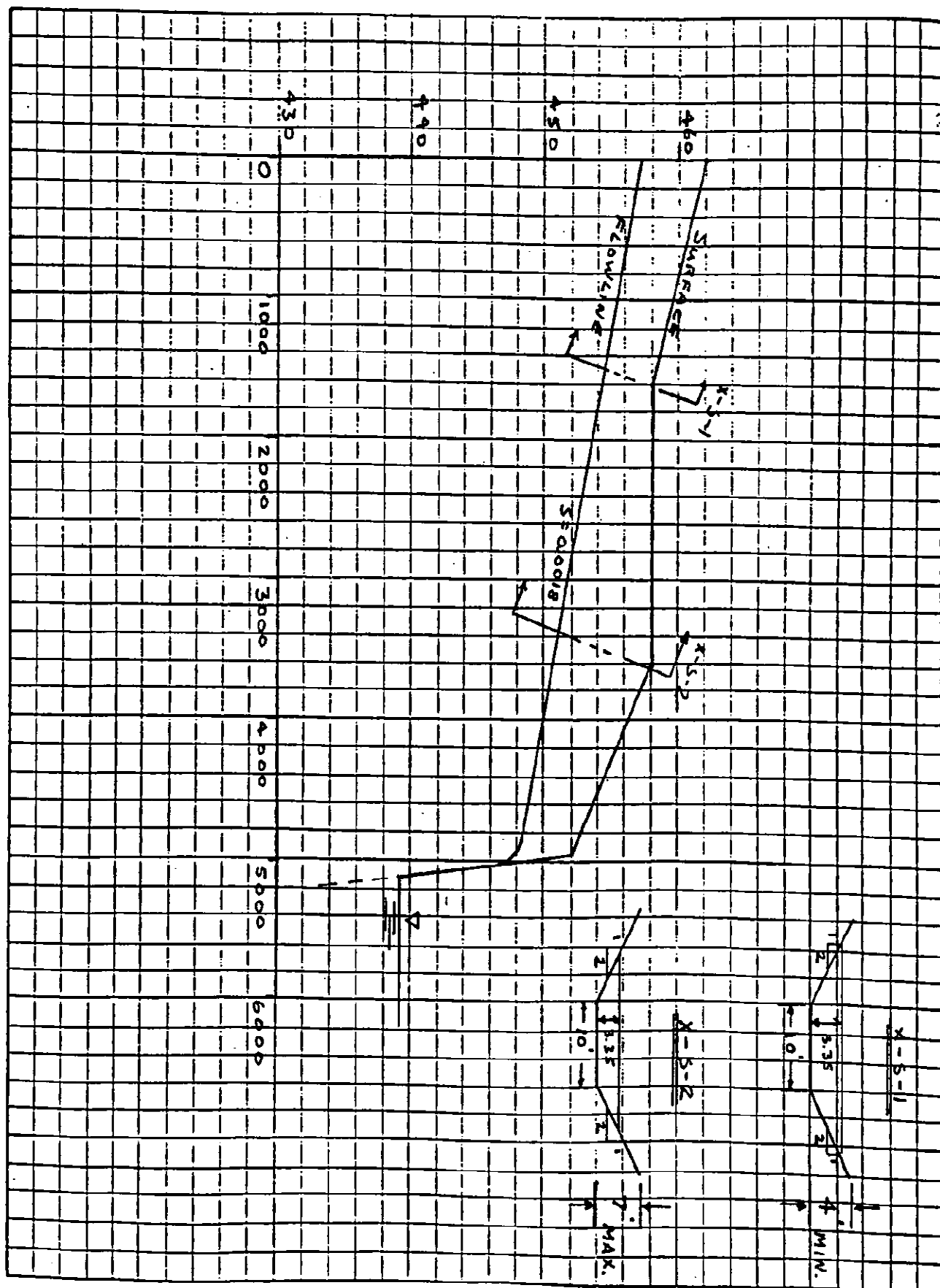
$$\begin{aligned} @ 1.0' \quad Q &= \frac{1.49 (12.00) (0.83)^{.67}}{0.030} (0.0018)^{.5} & Q &= Av \\ & & 22 &= 12v \\ &= 22 \text{ cfs} & 1.8 \text{ f/s} &= v \end{aligned}$$

$$\begin{aligned} @ 2.0' \quad Q &= \frac{1.49 (28.00) (1.48)^{.67}}{0.030} (0.0018)^{.5} & Q &= Av \\ & & 77 &= 28v \\ &= 77 \text{ cfs} & 2.75 \text{ f/s} &= v \end{aligned}$$

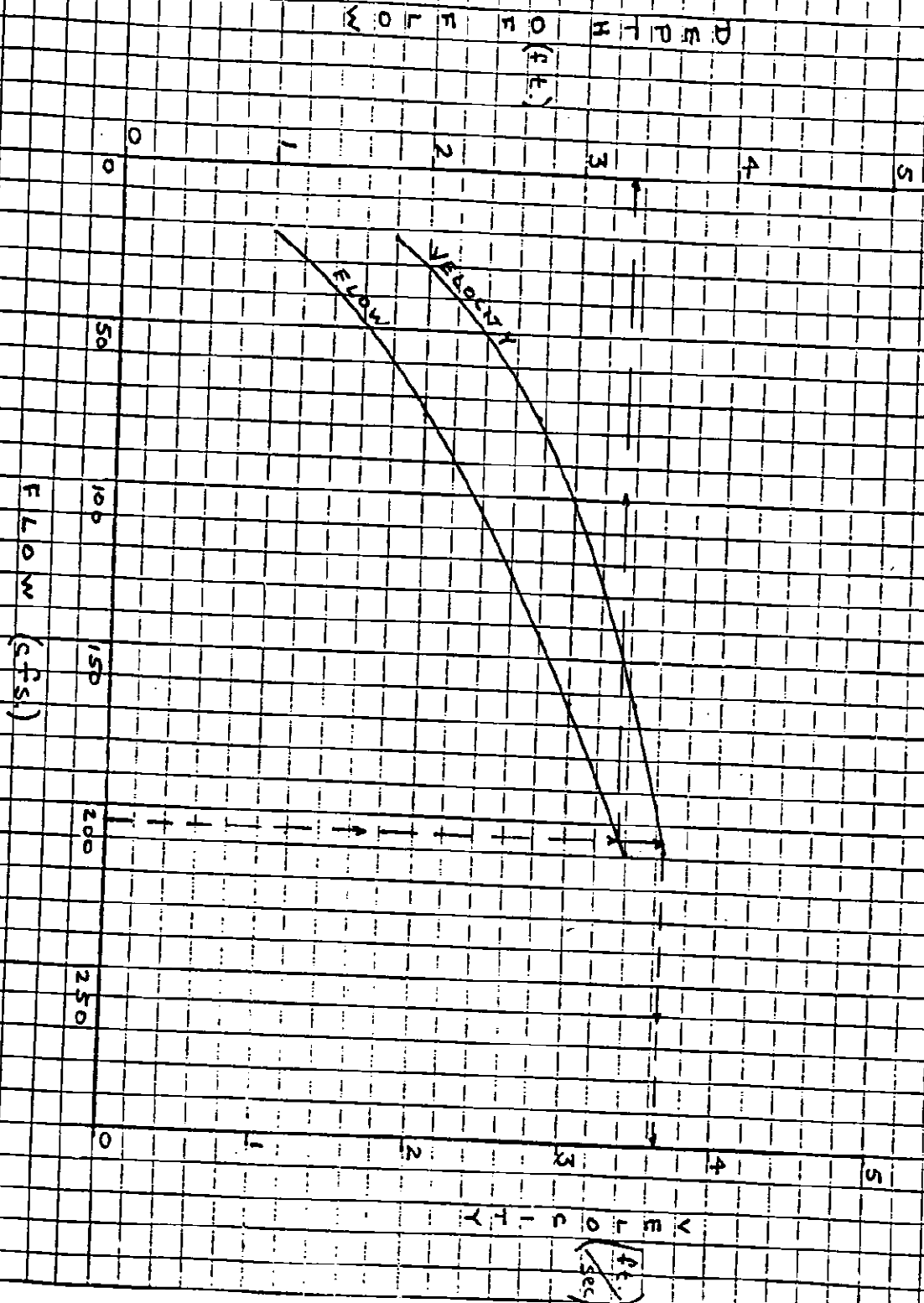
$$\begin{aligned} @ 3.0' \quad Q &= \frac{1.49 (48.00) (2.05)^{.67}}{0.030} (0.0018)^{.5} & Q &= Av \\ & & 164 &= 48v \\ &= 164 \text{ cfs} & 3.42 \text{ f/s} &= v \end{aligned}$$

$$\begin{aligned} @ 3.4' \quad Q &= \frac{1.49 (57.12) (2.27)^{.67}}{0.030} (0.0018)^{.5} & Q &= Av \\ & & 209 &= 57.12v \\ &= 209 \text{ cfs} & 3.66 \text{ f/s} &= v \end{aligned}$$

FLOWLINE PROFILE (DITCH H-1)



FLOW VS. VELOCITY (DITCH N-1)



## **BLASTING NOTIFICATION LIST**



Keene Roadbuilders  
RR 1  
Cutler, IL 62238

Illinois Power  
Rt. 51 South  
DuQuoin, IL 62832

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General Telephone Co.  
214 W. Monroe  
Carbondale, IL 62901

[REDACTED]

Perry County Board  
Perry County Courthouse  
Pinckneyville, IL 62274

[REDACTED]

City of Cutler  
City Hall  
Cutler, IL 62238

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Keene Roadbuilders  
RR 1  
Cutler, IL 62238

Illinois Power  
Rt. 51 South  
DuQuoin, IL 62832

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2. [illegible]  
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[illegible]

General Telephone Co.  
214 W. Monroe  
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[REDACTED]

Perry County Board  
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[REDACTED]

City of Cutler  
City Hall  
Cutler, IL 62238

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

PRE- AND POST-MINING LAND USE AND CAPABILITY  
BURNING STAR NO. 4 NORTH FIELD/EAST

		Pre-Mining		Post-Mining	
		<u>Affected*</u>	<u>Unaffected*</u>	<u>Affected</u>	<u>Unaffected*</u>
Cropland	Prime Farmland	1270.0	36.9	73.4	36.9
	High Capability (90% Productivity)			402.0	
	High Capability (100% Productivity)			794.6	
Pasture	High Capability	141.0	4.4	17.6	4.4
Forest	High Capability	425.2	7.7	184.6	7.7
	Topsoil Only			29.5	
Residential		33.7	16.9	--	16.9
Industrial/Commercial (Roads)		30.7	1.2	10.0	1.2
Wildlife Habitat (Riparian Forest)		--	--	278.0	--
Developed Water Resources		37.8	1.1	185.8	1.1
Undeveloped		<u>37.1</u>	<u>0.3</u>	<u>--</u>	<u>0.3</u>
		1975.5	68.5	1975.5	68.5

\* Land Use Only

Revised 1/30/86

- V(2)(B) Provide a description of how the proposed post-mining land uses are to be achieved, and describe any necessary support activities which will be needed to achieve the proposed land uses. Discuss the utility and capability of the reclaimed lands to support a variety of alternative uses and the relationship of the proposed uses to existing land use policies and plans. Provide a copy of the comments concerning the proposed land use by the owner of the surface of the proposed permit area and by the State or local government agencies which would have to initiate, implement, approve or authorize the proposed uses of the land following reclamation.

Upon completion of the reclamation requirements by Consolidation Coal Company, the reclaimed land will be managed by Consol during the bond liability period.

Management programs for the various post-mining land uses are outlined as follows:

- a) Forestry - A suitable herbaceous cover will be established on areas to be reforested to control erosion. A sufficient number of commercial tree species will be planted and maintained to meet the requirements of 1816.117 a,b. Management techniques that may be used are not limited to disease, insect and weed control, re-planting, thinning and fertilization. Species and rates of planting are listed in Part V 6c.
- b) Fish Wildlife Habitat - Wildlife habitat will be re-established through herbaceous and woody plantings. These plantings will be designed to maximize edge and provide travel corridors through reclaimed areas. Species and rates of planting are listed below in V)3)C. Incline impoundments and final cut lakes will be stocked with game fish. In addition, the forest areas and cropland lend themselves to utilization by different wildlife species.
- c) Developed Water Resources - The incline impoundments and final cut lakes will be a result of the mining operations. The slopes will be graded to provide access to these impoundments. The quality of the water will be acceptable for the intended uses i.e. water for domestic animals, irrigation of cropland, flood control and a water supply for industry, recreation and fish and wildlife habitat.



- d) Cropland - Those properties capable of rowcrop applications, will be seeded during the first appropriate season, with grass and legume species. Cover species to be utilized are given in Part V No. 6a. Seedbed preparation and fertilization will be employed as necessary to insure adequate stand establishment. This initial vegetation will reduce erosion and provide for general soil improvement.

In those areas where slope exceeds 3%, erosion control structures may be established. Terraces will be constructed in such a way as to permit the application of standard cultural practices.--

When rowcrop applications are warranted, land leveling will be implemented as necessary. Standard rowcrop practices, not limited to, plowing, discing, fertilization, insect and weed control, planting, cultivation, and harvesting, will be utilized in the appropriate manner for those crops applicable for the area.

- e) Pasture land - Pasture land acreage will be seeded, during the first appropriate season, with grass and legume species. Cover species to be utilized are given in Part V No. 6a. Seedbed preparation and fertilization will be employed as necessary to insure adequate stand establishment. The permanent vegetation will reduce erosion and provide for general soil improvement.

In those areas where slope exceeds 3%, erosion control structures may be established.

Pasture land may be utilized for grazing or hay production. These applications will be managed in such a fashion to prevent over grazing based on appropriate cow/calf per acre utilization or to insure the permanent establishment of the cover species.

In reviewing all the regulations that relate to reclamation, the reclaimed land will be capable of supporting the post-mining land uses. With respect to final grade, rooting media requirements, revegetation standards and productivity standards, the reclaimed land will have the potential to support a variety of uses. Cropland could be used for growing row crops, small grains, hay, nursery crops and orchard crops. Pastureland will be suitable for grazing or hay production. Wood and wood fiber can be grown from forestland. Fish and wildlife habitat will be able to support the requirements for wildlife. The developed water resources have the capability to produce necessary water for domestic uses, irrigation, recreation and fish and wildlife habitat.

In assessing the relationship of the proposed uses to existing land use policies and plans, our proposed land uses are identical. The post-mining land uses are compatible with the adjacent land uses and the proposed reclamation plan is a comprehensive plan to intergrate the reclaimed land with the surrounding area.

To our knowledge, we do not know of any government agencies that would have to initiate, implement, approve or authorize the proposed post-mining land uses other than the Regulatory Authority. However, we make every effort to solicit input to our reclamation program.

We have solicited comments regarding post-mining land uses from the appropriate lessors. Copies of our letters and a map showing locations of leased lands are attached. All lessors were provided with a copy of the Land Reclamation Map and allowed 30 days to provide us with comments. Two lessors have responded (copies of letters attached). No other comments have been received despite expiration of the 30 day comment period.

BURNING STAR NO. 4  
PERMIT 152  
SURFACE LEASES

TRACT NUMBER

NAME

026-097

[REDACTED]

026-175

[REDACTED]

026-176\*

[REDACTED]

026-177\*

[REDACTED]

026-178\*

[REDACTED]

026-179

[REDACTED]

026-192

[REDACTED]

026-196

[REDACTED]

\*Previously contacted. Lessors' concerns have been incorporated into reclamation plan attached. This notice will allow required submittal of written comments.



Consolidation Coal Company  
Mid-Continent Region  
12755 Olive Boulevard  
St. Louis, Missouri 63141  
(314) 275-2300

097  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P 201 112 062

January 15, 1986

[REDACTED]  
[REDACTED]  
Dear [REDACTED]

Consolidation Coal Company operates the Burning Star No. 4 Mine in Perry County, Illinois. The company presently is applying for an operating permit for this mine, under applicable laws of the State of Illinois.

You are being contacted as either:

- 1) a legal or equitable owner of record of surface to be included within the proposed permit area, or
- 2) a government agency having responsibility or authority over surface lands to be included within the proposed permit area.

In accordance with The Illinois Surface Coal Mining Land Conservation and Reclamation Act Rule 1780.23(b), the purpose of this letter is to request your comments on the company's proposal for post-mining land use following reclamation for surface areas Consolidation Coal Company leases from you. The proposed post-mining land uses are shown on the attached Map E (Land Reclamation Map) along with the location of your property.

You have 30 days from the day you receive this letter to submit written comments. If you choose not to comment, it will be assumed that you have no objection to the proposed post-mining land uses. If you do submit comments, they will be included in the permit application for review by government authorities and the general public.

Please submit your comments to my attention at the address listed above. You may call me at (314) 275-2300 if you have any questions. Thank you.

Sincerely,

*Richard Hiller*

Richard Hiller  
Permit Coordinator

RH:vms  
Enclosure

cc: E. Leifheit



Consolidation Coal Company  
Mid-Continent Region  
12755 Olive Boulevard  
St. Louis, Missouri 63141  
(314) 275-2300

175  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P201 112 064

January 15, 1986

[REDACTED]  
[REDACTED]  
[REDACTED]  
Dear [REDACTED]

Consolidation Coal Company operates the Burning Star No. 4 Mine in Perry County, Illinois. The company presently is applying for an operating permit for this mine, under applicable laws of the State of Illinois.

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Sincerely,

*Richard Hiller*

Richard Hiller  
Permit Coordinator

RH:vms  
Enclosure

cc: E. Leifheit



Consolidation Coal Company  
Mid-Continent Region  
12755 Olive Boulevard  
St. Louis, Missouri 63141  
(314) 275-2300

176  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P 201 112 076

January 15, 1986



Consolidation Coal Company operates the Burning Star No. 4 Mine in Perry County, Illinois. The company presently is applying for an operating permit for this mine, under applicable laws of the State of Illinois.

You are being contacted as either:

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You have 30 days from the day you receive this letter to submit written comments. If you choose not to comment, it will be assumed that you have no objection to the proposed post-mining land uses. If you do submit comments, they will be included in the permit application for review by government authorities and the general public.

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Sincerely,

Richard Hiller  
Permit Coordinator

RH:vms  
Enclosure

cc: E. Leifheit



Consolidation Coal Company  
Mid-Continent Region  
12755 Olive Boulevard  
St. Louis, Missouri 63141  
(314) 275-2300

177  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P201 112 073

January 15, 1986

[REDACTED]

Dear [REDACTED]

Consolidation Coal Company operates the Burning Star No. 4 Mine in Perry County, Illinois. The company presently is applying for an operating permit for this mine, under applicable laws of the State of Illinois.

You are being contacted as either:

- 1) a legal or equitable owner of record of surface to be included within the proposed permit area, or
- 2) a government agency having responsibility or authority over surface lands to be included within the proposed permit area.

In accordance with The Illinois Surface Coal Mining Land Conservation and Reclamation Act Rule 1780.23(b), the purpose of this letter is to request your comments on the company's proposal for post-mining land use following reclamation for surface areas Consolidation Coal Company leases from you. The proposed post-mining land uses are shown on the attached Map E (Land Reclamation Map) along with the location of your property. This map incorporates changes of the reclamation plan made following recent discussions between yourself and representatives of Consolidation Coal regarding the proposed reclamation of the surface areas leased from you.

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Please submit your comments to my attention at the address listed above. You may call me at (314) 275-2300 if you have any questions. Thank you.

Sincerely,

*Richard Hiller*

Richard Hiller  
Permit Coordinator

RH:vms  
Enclosure

cc: E. Leifheit



Consolidation Coal Company  
Mid-Continent Region  
12755 Olive Boulevard  
St. Louis, Missouri 63141  
(314) 275-2300

177  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P201 112 074

January 15, 1986

[REDACTED]  
[REDACTED]  
[REDACTED]  
Dear [REDACTED]

Consolidation Coal Company operates the Burning Star No. 4 Mine in Perry County, Illinois. The company presently is applying for an operating permit for this mine, under applicable laws of the State of Illinois.

You are being contacted as either:

- 1) a legal or equitable owner of record of surface to be included within the proposed permit area, or
- 2) a government agency having responsibility or authority over surface lands to be included within the proposed permit area.

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Please submit your comments to my attention at the address listed above. You may call me at (314) 275-2300 if you have any questions. Thank you.

Sincerely,

*Richard Hiller*

Richard Hiller  
Permit Coordinator

RH:vms  
Enclosure

cc: E. Leifheit





Consolidation Coal Company  
Mid-Continent Region  
12755 Olive Boulevard  
St. Louis, Missouri 63141  
(314) 275-2300

177  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P 201 112 075

January 15, 1986

[REDACTED]  
[REDACTED]  
[REDACTED]  
Dear [REDACTED]

Consolidation Coal Company operates the Burning Star No. 4 Mine in Perry County, Illinois. The company presently is applying for an operating permit for this mine, under applicable laws of the State of Illinois.

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Please submit your comments to my attention at the address listed above. You may call me at (314) 275-2300 if you have any questions. Thank you.

Sincerely,

*Richard Hiller*

Richard Hiller  
Permit Coordinator

RH:vms  
Enclosure

cc: E. Leifheit



Consolidation Coal Company  
Mid-Continent Region  
12755 Olive Boulevard  
St. Louis, Missouri 63141  
(314) 275-2300

177  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P 201 112 072

January 15, 1986

[REDACTED]

Dear [REDACTED]

Consolidation Coal Company operates the Burning Star No. 4 Mine in Perry County, Illinois. The company presently is applying for an operating permit for this mine, under applicable laws of the State of Illinois.

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Enclosure

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178  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P201 112 071

January 15, 1986

[REDACTED]

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Permit Coordinator

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Enclosure

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(314) 275-2300

179  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P 201 112 083

January 15, 1986

[REDACTED]  
Dear [REDACTED]

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Permit Coordinator

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Enclosure

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12755 Olive Boulevard  
St. Louis, Missouri 63141  
(314) 275-2300

192  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P 201 112 081

January 15, 1986

[REDACTED]  
[REDACTED]  
[REDACTED]  
Dear [REDACTED]

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Permit Coordinator

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Enclosure

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192  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P201 112 080

January 15, 1986

[REDACTED]

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Permit Coordinator

RH:vms  
Enclosure

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192  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P 201 112 079

January 15, 1986

[REDACTED]

Dear [REDACTED]

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Permit Coordinator

RH:vms  
Enclosure

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12755 Olive Boulevard  
St. Louis, Missouri 63141  
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(92  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P 201 112 078

January 15, 1986

[REDACTED]

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Permit Coordinator

RH:vms  
Enclosure

cc: E. Leifheit





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12755 Olive Boulevard  
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(314) 275-2300

192  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P 201 112 077

January 15, 1986

[REDACTED]  
[REDACTED]  
Dear [REDACTED]

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Enclosure

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192  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P 201 112 086

January 15, 1986

[REDACTED]  
Dear [REDACTED]

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RH:vms  
Enclosure

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196  
CERTIFIED  
RETURN RECEIPT REQUESTED  
P 201 112 065

January 15, 1986

[REDACTED]

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*Richard Hiller*

Richard Hiller  
Permit Coordinator

RH:vms  
Enclosure

cc: E. Leifheit

The replacement of 402.7 acres of riparian habitat and woodlands surrounding Galum Creek and adjacent water impoundments, will fulfill requirements for diverse populations of herpetofauna.

Reclamation of disturbed areas will proceed on a timely basis, as closely following disturbance as is practicable. We intend to complete final grading of reclaimed areas within one year of cessation of active use; texturing, topsoiling and seeding will similarly be completed within a reasonable time.

Since Perry County has no zoning board, to Consol's knowledge there are no land use authorities to consult for this proposed permit. However, the Perry County ASCS Office and the Perry County Board will both have opportunities to comment during their review period.

No public facilities are proposed.

Please refer to Part I, for the Engineering Certification.

No federal lands or land subject to federal jurisdiction are included in the proposed permit area.

#### 4. High Capability Lands

Are there any lands in the proposed permit area to be reclaimed to high capability land standards? Yes  X  No      . If yes, include applicable discussions.

- A. Locate on the post-mining map the location of the replaced high capability land. Give acreage totals.

Please refer to Part V, Map E, Land Reclamation Plan, for the location of replaced high capability lands. We propose to reclaim 1398.8 Ac. of high capability lands.

- B. Discuss how wind and water erosion will be minimized. Include discussions of construction, timing, seeding, seeding equipment to be used and erosion control structures to be used.

The primary control of wind and water erosion will be the vegetative cover. In areas to be left in vegetative cover for over one year, the seed mixture identified below with companion mulch crop will be seeded during the first favorable planting season following reclamation. In areas to be cropped the season following reclamation, the area will be seeded with a mulch crop only at the below specified rate.

Management Alternative #2:

After completion of final grading, the areas to be managed as hereinafter described will be seeded to a temporary mulch crop in accordance with the response to #4,B above. The following Fall, the temporary mulch will be plowed down, and the area will be seeded to wheat. After the wheat harvest the following Spring, land leveling will be conducted during the Summer months to correct differential settlement and minor drainage problems. The area will again be seeded to wheat in the Fall, with this sequence of events to be followed for approximately three years.

Following this initial management program, the area will be placed in a crop rotation intended to result in achieving the productivity requirements for final bond release.

- D. Discuss the timing of the construction and removal of the erosion control structures. If sediment ponds are proposed to be left to hold future sediment loss of cropland areas, describe long term maintenance plan.

"In-field" erosion control structures such as terraces and grassed waterways will be completed immediately following completion of the final grading, including topsoil placement, within a field. In the event pipe down drain installation is needed within or along the perimeter of a field, this work will be done as soon as practicable following final grading. Construction of such facilities must be preceded by detailed surveys and design of such structures. Additional time may be required for the receipt of construction bids and necessary material deliveries. However, in all cases, this work will be expedited as much as possible to prevent excessive erosion. All such erosion will be repaired in conjunction with the installation of the referenced structures.

Sediment ponds identified to be left are considered valuable in the control of any sediment that might escape from cropland areas. In the event such ponds may be filled with excessive sediment rendering them deficient in volume for long term sediment collection and storage, the pond volume will be increased by either removal of accumulated sediment or by increasing pond volume by raising the pond elevation by adjusting the spillway height and top of dam elevation, if necessary.

- F. Discuss the replacement of soil horizons with respect to horizon thickness and total root zone.

"A" horizon shall be removed in accordance with the regulations to a minimum depth of eight inches. Replacement of "A" horizon shall be to the average depth as determined from the "A" horizon depth surveys made prior to mining and submitted on the accompanying "A" horizon depth map. Replaced depth shall be that depth calculated by dividing the total volume of "A" horizon material to be removed by the total area to receive "A" horizon during the reclamation process.

The combined vertical thickness of the restored "A" horizon and the agricultural root medium will be a minimum of four feet.

- G. Discuss the methods of mulching to be used with respect to seasonal variation.

Regraded and topsoiled areas will be mulched with straw, hay or fiber materials. Straw and hay will be applied at a rate of 1 ton/acre. Fiber materials will be applied in accordance with manufacturers specifications. If necessary, chemical or mechanical anchors will be utilized. Department approval will be sought on a case by case basis for the use of in situ mulch alone or in conjunction with another mulch if Consol determines that adequate soil erosion control will be provided and that the mulch will be replaced by approved perennial species.

5. Backfilling and Grading

- A. 1. Describe how approximate original contour will be achieved. Discuss method employed for overburden removal, spoil placement, and grading, including the removal and redistribution.

Unconsolidated overburden (topsoil and root medium) will be removed with scrapers and either stockpiled or spread immediately on graded spoil. Consolidated overburden will be drilled and shot. One of our Bucyrus-Erie draglines (either the 1550 or the 2570) will then spoil the overburden, exposing the coal seam. The coal will be removed and cast overburden from the next pass will fill the pit. Due to a bulking factor present, sufficient overburden will exist to achieve approximate original contour of the reclaimed land. Root medium and topsoil will be placed on the graded cast overburden, then seeded with one of the mixtures listed in response IV)B above.

2. Indicate whether or not the volume of all available spoil and suitable waste material is sufficient or more than sufficient to achieve the approximate original contour (Thin Overburden - 1816.104 and Thick Overburden.

During the first favorable planting season after final grading is completed, a herbaceous cover will be established to control erosion. The herbaceous cover consists of Alfalfa 10 lbs/ac., Timothy 5 ~~Kentucky 31 tall fescue~~ 12 lbs./ac., Red clover 4 lbs./ac. and Orchard grass 10 lbs/ac. with a suitable temporary cover crop (1/2 bu./ac. oats, rye or wheat depending on season).

After the site is stabilized, the tree will be planted in the spring. The approximate planting dates are March to April 15 unless weather conditions require planting at a later date. To reduce the competition from the herbaceous cover, herbicide may be used.

Depending on the management objective, the species to be planted will be one or more of the following:

Black Locust	Ash	Pin Oak
Cottonwood	Sweetgum	Red Oak
Sycamore	Black Walnut	White Oak
Silver Maple	Burr Oak	Hickory

A. 6' x 6' spacing will be used which requires 961 trees per acre.

On areas where the post-mining land use will be wildlife (riparian forest) a herbaceous cover will be established during the first favorable planting season following final grading (Alsike clover 7 lbs./ac., red top 10 lbs./ac., perennial ryegrass 10 lbs./ac., sericea lespedeza 7 lbs./ac., with a cover crop of wheat or oats 25 lbs./ac.) Tree species to be planted will include all of the following (depending on availability):

Green ash	Silver maple
Shagbark hickory	Sweetgum
Burr oak	Black walnut
Pin oak	Cottonwood
Red oak	Blackgum
White oak	Redbud
Sycamore	

Trees will be planted on 6' x 6' spacings (961 trees/acre).

Fence rows will be planted as commercial forest.

- D. Describe and locate the vegetative reference area and the plan for maintaining appropriate management of these areas for the purposes of measuring ground cover, productivity and species density. If an alternate plan is proposed to measure productivity in lieu of the reference area, describe plan in detail.

Detail of reclamation and vegetation shall be assessed in accordance with guidelines for comparison of the restored areas to reference areas or other techniques for measurement of productivity (which consider local rainfall amount, soil types, required levels of management, etc.) as adopted by the Regulatory Authority at the time of demonstration of productivity or ground cover.

- E. If any of the post-mining land uses are to include industrial or residential uses, describe revegetation measures to control erosion.

None of the post-mining land uses are industrial or residential.



Boreholes and exploration holes will be sealed as follows: Those penetrating the coal seam will be sealed with a cement-water mixture from bottom of hole to the surface; shallow holes not penetrating the coal seam are sealed by backfilling the hole with natural materials removed during the drilling operation.

#### 10. Protection of Hydrologic Balance

The answer to this question has two basic parts. The first part deals with measures to be taken to protect: 1) the quality of surface and ground water systems, 2) the rights of present users of surface and ground water and 3) the quantity of surface and ground water or to provide alternative sources of water where the protection of quantity cannot be ensured. The second part contains the evidence that these measures are effective, in the form of a determination of the probable hydrologic consequences of the proposed surface mining activities.

##### 1. Control and/or Treatment of Surface and Groundwater Drainage.

1. Consolidation Coal Company intends to comply with the I.E.A.P. "Code of Good Operation Practices" by:

- A. Intercepting and diverting unaffected surface runoff.
- B. Implementing erosion control structures to reduce erosion on post-mining land.
- C. Constructing sediment ponds to contain runoff from effected area.
- D. Minimizing the amount of disturbed area.
- E. Stabilizing the soil through revegetation.
- F. Containing potentially acid producing material in areas that minimize adverse effected on water quality.

##### 2. A plan for treatment of surface and ground water drainage where required;

The basic treatment of drainage is sedimentation techniques. All drainage leaving the effected mine areas will be passed through a sedimentation pond. This drainage is typically composed of both surface and ground waters much of which is removed from active mine areas by pumps. If problems associated with pollutants such as iron, manganese, acid mine drainage, etc., occur,

other treatment methods such as aeration, addition of lime or soda ash, etc. will be employed. The I.E.P.A. will be contacted if treatment techniques other than sedimentation are employed.

3. Proposed quantitative limits on pollutants in discharges according to the more stringent (Parts 1810-1929 or other applicable State and Federal laws);

Consolidation Coal Company proposes to meet quantitative limits on pollutants in discharge according to the limits in NPDES permit requirements. General requirements are shown in Table 1 but it is possible that other parameters will be required based on NPDES review of water quality data at the site.

Table 1

#### Effluent Limitations and Monitoring

Parameter	Load Limits (lbs/day)		Concentration Limits (mg/l)		Sample Freq.	Sample Type
	30 Day Ave.	Daily Max.	30 Day Ave.	Daily Max.		
Flow						Measure when Monitor
TSS			35.0	70.0	1/mo.	Comp.
Iron (total)			3.0	6.0	1/mo.	Comp.
pH	6.0	pH 9.0			1/mo.	Grab
Alk/Acidity	Total Acidity shall not exceed total alkalinity				1/mo.	Grab

4. A plan for restoration of the approximate recharge capacity of the permit area; ~~and~~.

If it is determined that the water supply of an owner of interest in real property who obtains all or part of their supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source can no longer use the supply due to contamination, diminution or interruption resulting from the Company's surface mining activities it will be replaced by the Company.

## II. Probable Hydrologic Consequences

### Location and Climate

The proposed permit area at Consolidation Coal Company's Burning Star No. 4 Mine lies within T5S R4W of Perry County and encompasses parts of Sections 22, 23, 26, 27, 34 and 35. The permit area is drained primarily by Bonnie Creek which is within the Galum Creek watershed. Galum Creek has a

List each map unit of High Capability Lands in the permit area and give acreages for each with respect to areas which will incur actual mining (removal of overburden and extraction of coal) and to areas which will incur other forms of disturbance (road, ditches, etc.).

Soil Mapping Units by Land Use  
To be Mined Area (Overburden Removal and/or Deposition)

Mapping Unit	To Be Mined Acreage	Prime Farmland				High Capability				High Capability				Other Lands				Roads	Water	Resid.
		Crop-Land	Wood-Land	Pasture	Undev.	Crop-Land	Wood-Land	Pasture	Undev.	Crop-Land	Wood-Land	Pasture	Undev.	Crop-Land	Wood-Land	Pasture	Undev.			
2	52.0	3.2	--	--	--	47.9	--	--	--	--	--	--	--	--	--	--	--	0.9	--	--
3A	3.3	--	--	--	--	3.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3B	36.6	4.3	--	--	--	26.0	4.0	1.0	--	--	--	--	--	--	--	--	--	1.3	--	--
5C3	87.3	--	--	--	--	--	--	--	--	--	--	--	--	69.0	1.0	12.3	1.7	1.2	--	2.1
5D	10.7	--	--	--	--	--	--	--	--	--	--	--	--	--	6.7	0.2	--	0.2	--	--
5D3	19.2	--	--	--	--	--	--	--	--	--	--	--	--	11.8	0.6	5.6	1.1	0.1	--	--
8E	28.0	--	--	--	--	--	--	--	--	--	--	--	--	0.8	18.9	8.1	0.1	0.1	--	--
8E3	4.2	--	--	--	--	--	--	--	--	--	--	--	--	3.3	0.8	--	--	0.1	--	--
108	170.6	1.4	--	0.8	--	84.0	72.3	10.9	--	--	--	--	--	--	--	--	--	1.2	--	--
164A	149.8	24.1	13.7	2.0	--	96.2	8.9	--	--	--	--	--	--	--	--	--	--	2.9	--	2.0
164B	212.7	21.5	10.2	2.0	--	135.4	29.1	0.5	0.3	--	--	--	--	--	--	--	--	5.7	--	8.0
164B2	71.8	9.3	1.4	--	--	54.9	0.8	0.7	--	--	--	--	--	--	--	--	--	1.0	--	3.7
165	121.2	--	--	--	--	--	--	--	--	67.4	50.9	0.1	--	--	--	--	--	2.8	--	--
214B	74.9	8.1	0.3	16.5	--	35.8	9.1	0.7	1.0	--	--	--	--	--	--	--	--	0.6	--	1.8
214C3	169.3	--	--	--	--	--	--	--	--	--	--	--	--	139.7	14.6	4.4	0.5	3.4	--	6.7
382	505.7	1.5	0.5	48.8	--	239.9	145.2	8.9	30.3	--	--	--	--	--	--	--	--	6.6	21.5	2.5
787	16.7	--	--	--	--	7.9	--	8.5	0.3	--	--	--	--	--	--	--	--	--	--	--
B50D3	86.5	--	--	--	--	--	--	--	--	--	--	--	--	59.5	22.0	2.3	1.8	0.7	--	0.2
900E	5.6	--	--	--	--	--	--	--	--	--	--	--	--	0.1	4.1	--	--	--	--	1.4
912A	27.9	--	--	--	--	--	--	--	--	27.7	--	0.2	--	--	--	--	--	--	--	--
912B2	95.0	--	--	--	--	--	--	--	--	85.0	--	6.5	--	--	--	--	--	1.8	--	1.7
1108	10.2	--	--	--	--	--	--	--	--	--	--	--	--	--	10.1	--	--	0.1	--	--
Water	16.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.3	--
1975.5		73.4	26.1	70.1	--	732.3	269.4	31.2	31.9	180.1	50.9	6.8	--	284.2	78.8	32.9	5.2	30.7	37.8	33.7

Adjustments 2/3/86: + 21.5 Ac. 382 Creek Channel  
- 21.5 Ac. 382 Woodland

(Continued)

Soil Mapping Units by Land Use  
Other Disturbance Areas

Mapping Unit	Other Dist. Acreage	Prime Farmland				Prime Farmland Acquired Prior to 7-3-77				High Capability				Other Lands				Roads	Water	Resid.
		Crop-Land	Wood-Land	Pasture	Undev.	Crop-Land	Wood-Land	Pasture	Undev.	Crop-Land	Wood-Land	Pasture	Undev.	Crop-Land	Wood-Land	Pasture	Undev.			
2	2.6	--	--	--	--	2.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3A	1.2	--	--	--	--	0.7	--	0.5	--	--	--	--	--	--	--	--	--	--	--	--
3B	0.6	--	--	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
5C3	4.9	--	--	--	--	--	--	--	--	--	--	--	--	3.9	--	1.0	--	--	--	0.3
5D	0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.3
5D3	1.1	--	--	--	--	--	--	--	--	--	--	--	--	1.1	--	--	--	--	--	--
8E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8E3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
108	3.4	--	--	--	--	2.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
164A	5.3	0.5	--	--	--	1.1	--	--	--	--	--	--	--	--	--	--	--	0.1	--	1.0
164B	11.3	2.5	--	0.3	--	4.4	0.4	1.5	--	--	--	--	--	--	--	--	--	0.7	--	3.6
164B2	1.7	0.8	--	--	--	0.3	0.2	--	--	--	--	--	--	--	--	--	--	--	--	1.5
165	1.9	--	--	--	--	--	--	--	--	1.9	--	--	--	--	--	--	--	--	--	0.4
214B	6.8	1.0	--	0.2	--	2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
214C3	8.7	--	--	--	--	--	--	--	--	--	--	--	--	3.5	0.2	--	--	--	--	3.1
382	13.0	--	--	--	--	5.5	6.2	0.4	0.3	--	--	--	--	--	--	--	--	--	--	5.0
787	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.6	--
850D3	3.0	--	--	--	--	--	--	--	--	--	--	--	--	0.6	0.3	0.2	--	0.2	--	1.7
900E	0.6	--	--	--	--	--	--	--	--	--	--	--	--	--	0.4	--	--	0.2	--	--
912A	1.2	--	--	--	--	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--	--
912B2	0.4	--	--	--	--	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--
1108	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Water	0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5	--
68.5		4.8	--	0.5	--	19.5	6.8	2.7	0.3	3.5	--	--	--	9.1	0.9	1.2	--	1.2	1.1	16.9

Adjustments 2/3/86 + 0.6 382 Creek Channel  
 - 0.6 382 Woodland

- e. If B & C horizons are proposed to be mixed, submit evidence to support proposal. Soil samples must be taken on the permit site to obtain the material necessary to obtain the above-required information. Sample site locations are to be indicated on the soils map.

Consolidation Coal Company proposes to use a mixture of "B" and "C" horizon (mainly "C" horizon) as room media for our replaced prime farmland areas. To support a B/C Mix, the unconsolidated material for the area to be affected by overburden removal was sampled at 21 sites. The limiting factor in sampling depth was sand and/or soft shale. Also to obtain additional "B" horizon data, each prime farmland soil mapping unit was sampled to a depth of 4 feet at numerous sites.

Refer to table on the following page for more details and attached Soil Map for sample site locations.

Attached please find the following revised pages in Volume II:

A-29  
A-31  
A-32  
A-35 thru A-46

A-298

B-1  
B-5

Revised 8/5/85

Soil Mapping Unit	Acreage* & Percent of Prime Overburden Removal Area		4' Cores Field
2	3.2 Ac.	4.4%	13 14
3B	4.3 Ac.	5.9%	15 16
108	1.4 Ac.	1.9%	17 18
164A	24.1 Ac.	32.8%	3 7 22 24
164B	21.5 Ac.	29.3%	1 6 10 20 21
164B <sub>2</sub>	9.3 Ac.	12.7%	2 8 23
214B	8.1 Ac.	11.0%	5 9 11 19
382	1.5 Ac.	2.0%	4 12 25 26

Prime Farmland (Cropland)  
Overburden  
Removal Area

73.4 Ac.

100%

26 Sample Sites

\*Prime Farmland (Cropland)

Revised 8/5/85

The continuous samples were obtained by using a drilling rig equipped with a three inch solid tube sampler for the deep cores and a two inch slotted tube sampler for the 4' cores. At the sample site the material was bagged and labeled.

The samples were sent to A & L Great Lakes Agricultural Laboratories Inc. of Fort Wayne, Indiana for soil analysis. In the laboratory the following chemical and physical parameters were analyzed:

Organic Matter (%)  
[The % Organic Matter content is determined chemically on the dried screened soil sample.]  
Phosphorus (Bray-1) ppm  
                    (Bray-2) ppm  
Potassium ppm  
Magnesium ppm  
Calcium ppm  
Sodium ppm  
Soil pH  
Buffer pH  
Hydrogen meq/100 grams  
Cation Exchange Capacity meq/100 grams  
[The cation exchange capacity is a measure of the capacity of a soil to hold exchangeable cations. These include Hydrogen ( $H^+$ ), Calcium ( $Ca^{++}$ ), Magnesium ( $Mg^{++}$ ), Potassium ( $K^+$ ) and Sodium ( $Na^+$ ).]  
Zinc ppm  
Manganese ppm  
Iron ppm  
Copper ppm  
Soluble salts mmhos/cm  
Texture % Sand  
            % Silt  
            % Clay  
[Texture analysis by hydrometer method]  
  
Total cations exchange capacity by Ammonium acetate method.

To aid in the data processing the following assumptions were made; 0-1' depth equals the topsoil and 1-4' depth equals the "B" horizon sample. Therefore, in reviewing the laboratory data, keep in mind that the actual topsoil depths (a combination of "A" and "E" horizon) may be less than one foot or greater than one foot in depth, depending on the soil type sampled and the location of the sample site within the soil mapping unit, refer to Topsoil Depths Survey Map for actual topsoil depths.

A weighted average for each sample site in terms of B Horizon was calculated (1-2' = 33%) (2-4' = 67%). The samples were then grouped by soil mapping units and an average B Horizon value was calculated for each soil parameter by soil mapping unit.

A projected Prime "B" Horizon was calculated with consideration taken in terms of the percent influence each prime soil mapping unit has on the prime farmland area to be affected by overburden removal.

Prime Farmland (Cropland)  
Overburden Removal Area

Soil Mapping Unit	Acreage	%
2	3.2	4.4
3B	4.3	5.9
108	1.4	1.9
164A	24.1	32.8
164B	21.5	29.3
164B2	9.3	12.7
214B	8.1	11.0
382	1.5	2.0
	<u>73.4</u>	<u>100%</u>

Using the 21 deep cores (16 in prime units, 5 in nonprime units), a projected B/C mix was calculated.

The calculations were done as follows, an average sample site value for each parameter was determined by averaging data to our projected maximum borrow depth for each sample site, with those averages sumtotal up and divided by the number of sample sites to determine a projected B/C mix.

Note that this B/C mix calculation method lends disproportionately heavy weight to the sample sites with shallow depths; this is the most likely situation under actual operating conditions.

The above data sheets and calculations are attached for review.



Attached on the following page please find a summary of the comparison of the Prime B Horizon versus a B/C mis for the following parameters:

Soil pH	% Sand
P-1 (available phosphorous)	% Silt
P-2 (reserve phosphorous)	% Clay
K (extractable potassium)	CEC

Revised 8/5/85

A-31a

SUMMARY OF THE COMPARISON OF PRIME "B" HORIZON  
VERSUS  
B/C MIX

PARAMETER	"B" HORIZON (MEAN)	B/C MIX (MEAN)	COMMENTS
(H+)M/L	20.5	4.2	The soil will be greatly improved with the use of a B/C Mix in lieu of the B Horizon alone.
pH from H+	4.7	5.4	
Straight Line	4.9	6.2	
Average Soil pH			
Available Phosphorus BRAY-1	20 ppm P	15 ppm P	The B/C Mix will have a slightly lower phosphorus level.
Reserve Phosphorus BRAY-2	33 ppm P	28 ppm P	
Extractable Potassium	85 ppm K	102 ppm K	The B/C Mix will have an improved extractable potassium level.
Percent Sand	16%	23%	The soil texture should change slightly from a silty clay loam to a clay loam.
Percent Silt	54%	49%	
Percent Clay	30%	28%	
Texture Classification	Silty Clay Loam	Clay Loam	
Cation Exchange (Estimated)	19.8 Meq.	19.4 Meq.	- - - - -
Capacity Meq/100 grams soil (Total)	19.26 Meq	13.50 Meq.	

Revised 8/5/85

Summary Sheet Burning Star No. 4 Mine East of Jamestown Road 4' Cores  
Chemical & Physical Soil Analysis for B Horizon 1-4'  
Weighted Avg. 1-2' = 33% 2-4' = 67%

Estimated "B" Horizon Depth

Sample Site #	Soil Mapping Unit	Sample Depth	Est. "B" Horizon Depth	% OM	P <sub>1</sub> ppm	P <sub>2</sub> ppm	K ppm	Mg ppm	Ca ppm	Na ppm	Soil pH	H <sup>+</sup>	H/pH	CEC	Total CEC	% Base Saturation				% Na		Zn ppm	Mn ppm	Fe ppm	Cu ppm	Partical Size Analysis			
																%K	%Mg	%Ca	%H	%Na	%CEC					SS	%Sa	%Si	%Cl
1	164B	0-4'	1-4'	0.4	23	29	82	330	1100	110	4.8	16.0	4.8	16.8	17.73	1.2	14.9	34.2	47.0	2.6	2.7	5.8	20	63	1.8	0.1	17	54	29
2	164B2	0-4'	1-4'	0.2	20	31	96	451	1034	82	4.5	32.08	4.5	23.3	20.05	1.1	15.6	23.7	57.0	1.6	1.8	2.1	30	98	2.0	0.1	18	49	33
3	164A	0-4'	1-4'	0.2	21	31	85	550	1350	109	4.6	27.31	4.6	26.7	18.61	0.8	16.1	26.1	55.3	1.7	2.5	2.0	11	47	1.5	0.1	20	49	31
4	382	0-4'	1-4'	0.7	6	11	37	325	1216	81	6.7	0.24	6.6	9.7	9.43	1.0	28.0	62.6	5.0	3.4	3.7	1.7	23	57	1.9	0.2	36	47	17
5	214B	0-4'	1-4'	0.2	18	26	94	473	1067	100	4.7	24.74	4.6	22.3	20.60	1.1	16.4	28.3	52.4	1.8	2.1	1.9	8	53	1.7	0.1	18	54	28
6	164B	0-4'	1-4'	0.3	17	23	83	428	932	92	4.8	16.7	4.8	17.1	17.12	1.2	19.0	30.2	47.4	2.2	2.3	1.6	6	50	1.3	0.1	38	36	26
7	164A	0-4'	1-4'	0.3	21	31	80	304	783	109	4.6	25.0	4.6	15.5	15.49	1.3	15.5	25.2	54.0	3.0	3.0	2.4	19	81	1.7	0.1	17	54	29
8	164B2	0-4'	1-4'	0.3	8	13	80	400	982	64	4.7	22.03	4.7	18.0	17.34	1.1	18.5	27.1	51.7	1.6	1.6	1.8	8	53	2.0	0.1	13	58	29
9	214B	0-4'	1-4'	0.4	6	10	71	328	1165	62	4.8	15.48	4.8	16.8	12.39	1.0	15.5	36.6	45.3	1.6	2.2	1.4	3	52	1.5	0.1	15	54	31
10	164B	0-4'	1-4'	0.3	20	35	85	395	966	118	4.5	31.09	4.5	21.7	20.47	1.0	13.2	27.6	56.0	2.2	2.4	1.8	4	75	1.7	0.1	12	51	37
11	214B	0-4'	1-4'	0.4	30	43	104	582	1202	263	4.7	20.0	4.7	24.8	21.22	1.1	18.5	25.5	50.5	4.4	4.6	2.0	6	57	1.9	0.2	15	48	37
12	382	0-4'	1-4'	0.8	6	20	16	226	1016	130	5.3	13.48	4.9	12.2	8.58	0.3	15.8	43.2	35.9	4.8	4.8	1.2	17	34	1.3	0.5	16	66	18
13	?	0-4'	1-4'	0.5	4	32	89	478	1620	178	5.3	5.43	5.3	19.1	18.81	1.1	19.6	43.4	32.2	3.7	4.1	1.4	12	31	1.7	0.2	14	52	34
14	?	0-4'	1-4'	0.6	15	20	79	410	1336	213	5.0	9.58	5.0	18.3	17.94	1.0	17.0	37.4	40.0	4.6	5.2	1.6	15	31	1.6	0.2	12	59	29
15	3B	0-4'	1-4'	0.6	4	29	73	472	1585	268	5.6	5.16	5.3	17.5	15.37	1.0	21.4	45.3	26.0	6.3	7.6	2.7	6	50	2.1	0.2	10	62	28
16	3B	0-4'	1-4'	0.5	10	12	89	418	1436	491	5.8	3.03	5.5	15.6	16.66	1.4	19.2	46.8	20.6	12.0	12.8	1.3	5	27	1.5	0.2	12	59	29
17	100	0-4'	1-4'	0.7	10	17	13	192	899	138	7.2	0.07	7.2	6.8	8.87	0.5	24.0	65.5	0.2	8.8	6.8	1.1	7	36	1.6	0.2	17	68	15
18	10B	0-4'	1-4'	1.0	7	13	32	294	1382	100	6.8	0.15	6.8	10.1	10.03	0.8	24.3	68.1	2.5	4.3	4.3	1.8	20	35	1.7	0.1	26	55	19
19	214B	0-4'	1-4'	0.2	5	6	64	300	800	53	4.8	16.96	4.8	13.2	14.03	1.2	19.3	30.3	47.3	1.9	1.6	1.3	4	42	1.5	0.1	22	54	24
20	164B	0-4'	1-4'	0.3	15	20	56	271	851	111	5.1	9.50	5.0	11.3	13.42	1.2	17.6	38.7	38.6	3.9	3.6	1.6	10	58	1.7	0.1	12	65	23
21	164B	0-4'	1-4'	0.4	13	51	118	553	1535	1056	5.4	5.97	5.2	23.2	18.33	1.3	18.5	31.6	30.3	18.3	25.0	5.2	16	62	2.2	1.0	12	57	31
22	164A	0-4'	1-4'	0.3	6	9	82	394	784	176	4.6	23.96	4.6	17.3	20.30	1.2	18.7	22.8	53.0	4.3	3.8	2.7	47	88	1.7	0.2	16	53	31
23	164B2	0-4'	1-4'	0.3	40	56	105	994	1350	1059	4.4	44.06	4.4	55.9	21.49	0.5	15.0	12.9	63.4	8.2	8.2	3.1	5	70	2.0	1.9	10	57	33
24	164A	0-4'	1-4'	0.3	61	106	110	597	1518	374	4.5	32.0	4.5	34.5	21.67	0.8	14.5	22.1	58.0	4.6	4.7	3.5	9	46	2.2	0.5	12	57	31
25	382	0-4'	1-4'	0.6	21	34	43	175	700	104	4.8	15.31	4.8	10.2	9.96	1.1	14.2	34.1	46.2	4.4	4.4	1.6	17	163	1.8	0.1	17	62	21
26	382	0-4'	1-4'	0.6	3	4	24	157	930	27	5.5	3.34	5.5	8.3	6.80	0.7	15.7	56.2	26.0	1.4	1.8	1.6	12	33	1.5	0.1	30	59	11

Summary Sheet Burning Star No. 4 Mine East of Jamestown Road 4' Cores  
 Chemical & Physical Soil Analysis for B Horizon 1-4'  
 Weighted Avg. 1-2' = 33% 2-4' = 67%

Soil Mapping Unit	No. of Sample Sites	% OM	P <sub>1</sub> ppm	P <sub>2</sub> ppm	K ppm	Mg ppm	Ca ppm	Na ppm	Soil pH	H <sup>+</sup>	H/pH	CEC	Total CEC	% Base Saturation					% Na T.CEC	Zn ppm	Mn ppm	Fe ppm	Cu ppm	SS	Particle Size Analysis		
														%K	%Mg	%Ca	%H	%Na							%Sa	%Si	%Cl
2	2	0.6	10	26	84	444	1478	196	5.2	7.51	5.1	18.7	18.15	1.0	18.3	40.4	36.1	4.2	4.6	1.5	14	31	1.6	0.2	13	56	31
3B	2	0.6	7	20	81	445	1510	380	5.7	4.10	5.4	16.6	16.02	1.2	20.3	46.0	23.3	9.2	10.2	2.0	6	38	1.8	0.2	11	60	29
108	2	0.8	8	15	22	243	1140	119	7.0	0.11	7.0	8.4	9.45	0.6	24.2	67.3	1.4	6.5	5.6	1.4	14	35	1.6	0.2	22	61	17
164A	4	0.3	27	44	89	461	1109	192	4.6	27.07	4.6	23.5	19.02	1.0	16.2	24.3	55.1	3.4	3.5	2.6	22	65	1.8	0.2	16	53	31
165B	5	0.3	18	32	85	395	1077	297	4.9	15.85	4.8	18.0	17.41	1.2	16.6	32.5	43.9	5.8	7.2	7.5	11	62	1.7	0.3	18	53	29
164B2	3	0.3	23	34	94	615	1122	402	4.5	32.4	4.5	19.6	31.10	0.9	16.7	21.2	57.4	3.8	3.9	2.3	14	74	2.0	0.7	13	55	32
214B	4	0.3	15	21	83	421	1058	120	4.8	19.29	4.7	19.3	17.06	1.1	17.4	30.2	48.9	2.4	2.6	1.6	21	51	1.6	0.1	18	52	30
3B2	4	0.7	9	17	30	221	966	86	5.6	8.09	5.1	10.1	8.69	0.8	18.4	49.0	28.3	3.5	3.7	1.5	17	72	1.6	0.2	25	58	17

Calculated Prime "B" Horizon  
Chemical and Physical Soil Analysis  
Sheet No. 1

Soil Mapping Unit	% OM	% Influence	Contribution to the Whole
2	0.6	4.4	0.0264
3	0.6	5.9	0.0354
108	0.8	1.9	0.0152
164A	0.3	32.8	0.0984
164B	0.3	29.3	0.0879
164B2	0.3	12.7	0.0381
214B	0.3	11.0	0.0330
382	0.7	2.0	0.0140

Calculated Prime "B" Horizon      100%      0.3484

Soil Mapping Unit	P1	% Influence	Contribution to the Whole
2	10	4.4	0.440
3B	7	5.9	0.413
108	8	1.9	0.152
164A	27	32.8	8.856
164B	18	29.3	5.274
164B2	23	12.7	2.921
214B	15	11.0	1.650
382	9	2.0	0.180

Calculated Prime "B" Horizon      100%      19.886

Soil Mapping Unit	P1	% Influence	Contribution to the Whole
2	26	4.4	1.144
3B	20	5.9	1.180
108	15	1.9	0.285
164A	44	32.8	14.432
164B	32	29.3	9.376
164B2	34	12.7	4.318
214B	21	11.0	2.310
382	17	2.0	0.340

Calculated Prime "B" Horizon      100%      33.385

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Calculated Prime "B" Horizon  
Chemical and Physical Soil Analysis  
Sheet No. 2

Soil Mapping Unit	K	% Influence	Contribution to the Whole
2	84	4.4	3.696
3B	81	5.9	4.779
108	22	1.9	0.418
164A	89	32.8	29.192
164B	85	29.3	24.905
174B2	94	12.7	11.938
214B	83	11.0	9.130
382	30	2.0	0.600
Calculated Prime "B" Horizon		100%	84.658

Soil Mapping Unit	Mg	% Influence	Contribution to the Whole
2	444	4.4	19.536
3B	445	5.9	26.255
108	243	1.9	4.617
164A	461	32.8	151.208
164B	395	29.3	115.735
164B2	615	12.7	78.105
214B	421	11.0	46.310
382	221	2.0	4.420
Calculated Prime "B" Horizon		100%	446.186

Soil Mapping Unit	Ca	% Influence	Contribution to the Whole
2	1478	4.4	65.032
3B	1510	5.9	89.090
108	1140	1.9	21.660
164A	1109	32.8	363.752
164B	1077	29.3	315.561
164B2	1122	12.7	142.494
214B	1058	11.0	116.380
382	966	2.0	19.320
Calculated Prime "B" Horizon		100%	1133.289

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Calculated Prime "B" Horizon  
Chemical and Physical Soil Analysis  
Sheet 3

Soil Mapping Unit	Na	% Influence	Contribution to the Whole
2	196	4.4	8.624
3	380	5.9	22.420
108	119	1.9	2.261
164A	192	32.8	62.976
164B	297	29.3	87.021
164B2	402	12.7	51.054
214B	120	11.0	13.200
382	86	2.0	1.720
Calculated Prime "B" Horizon		100%	249.276

Soil Mapping Unit	Soil pH	% Influence	Contribution to the Whole
2	5.2	4.4	0.2288
3B	5.7	5.9	0.3363
108	7.0	1.9	0.1330
164A	4.6	32.8	1.5088
164B	4.9	29.3	1.4357
164B2	4.5	12.7	0.5715
214B	4.8	11.0	0.5280
382	5.6	2.0	0.1120
Calculated Prime "B" Horizon		100%	4.8541

Soil Mapping Unit	H/pH	% Influence	Contribution to the Whole
2	5.1	4.4	0.3304
3B	5.4	5.9	0.2419
108	7.0	1.9	0.0021
164A	4.6	32.8	8.8790
164B	4.8	29.3	4.6440
164B2	4.5	12.7	4.1148
214B	4.7	11.0	2.1219
382	5.1	2.0	0.1618
Calculated Prime "B" Horizon		100%	20.4959 or pH 4.7

Revised 8/5/85

Calculated Prime "B" Horizon  
Chemical and Physical Soil Analysis  
Sheet No. 4

Soil Mapping Unit	CEC	% Influence	Contribution to the Whole
2	18.7	4.4%	0.8228
3B	16.6	5.9	0.9794
108	8.4	1.9	0.1596
164A	23.5	32.8	7.708
164B	18.0	29.3	5.274
164B2	19.6	12.7	2.4892
214B	19.3	11.0	2.123
382	10.1	2.0	0.202
Calculated Prime "B" Horizon		100%	19.758

Soil Mapping Unit	Total CEC	% Influence	Contribution to the Whole
2	18.15	4.4	0.7986
3B	16.02	5.9	0.9452
108	9.45	1.9	0.1796
164A	19.02	32.8	6.2386
164B	17.41	29.3	5.1011
164B2	31.10	12.7	3.9497
214B	17.06	11.0	1.8766
382	8.69	2.0	0.1738
Calculated Prime "B" Horizon		100%	19.2632

Soil Mapping Unit	% K	% Influence	Contribution to the Whole
2	1.0	4.4	0.0440
3B	1.2	5.9	0.0708
108	0.6	1.9	0.0114
164A	1.0	32.8	0.3280
164B	1.2	29.3	0.3516
164B2	0.9	12.7	0.1143
214B	1.1	11.0	0.1210
382	0.8	2.0	0.0160
Calculated Prime "B" Horizon		100%	1.0571

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Calculated Prime "B" Horizon  
Chemical and Physical Soil Analysis  
Sheet No. 5

Soil Mapping Unit	% Mg	% Influence	Contribution to the Whole
2	18.3	4.4	0.8052
3B	20.3	5.9	1.1977
108	24.2	1.9	0.4636
164A	16.2	32.8	5.3136
164B	16.6	29.3	4.8638
164B2	16.7	12.7	2.1209
214B	17.4	11.0	1.9140
382	18.4	2.0	0.3680
Calculated Prime "B" Horizon		100%	17.0468

Soil Mapping Unit	% Ca	% Influence	Contribution to the Whole
2	40.4	4.4	1.7776
3B	46.0	5.9	2.7140
108	67.3	1.9	1.2787
164A	24.3	32.8	7.9704
164B	32.5	29.3	9.5225
164B2	21.2	12.7	2.6924
214B	30.2	11.0	3.3220
382	49.0	2.0	0.9800
Calculated Prime "B" Horizon		100%	30.2576

Soil Mapping Unit	% H	% Influence	Contribution to the Whole
2	36.1	4.4	1.5884
3B	23.3	5.9	1.3747
108	1.4	1.9	0.0266
164A	55.1	32.8	18.0728
164B	43.9	29.3	12.8627
164B2	57.4	12.7	7.2898
214B	48.9	11.0	5.3790
382	28.3	2.0	0.5660
Calculated Prime "B" Horizon		100%	47.16

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Calculated Prime "B" Horizon  
Chemical and Physical Soil Analysis  
Sheet No. 6

Soil Mapping Unit	% Na	% Influence	Contribution to the Whole
2	4.2	4.4	0.1848
3B	9.2	5.9	0.5428
108	6.5	1.9	0.1235
164A	3.4	32.8	1.1152
164B	5.8	29.3	1.6994
164B2	3.8	12.7	0.4826
214B	2.4	11.0	0.2640
382	3.5	2.0	0.0700
Calculated Prime "B" Horizon		100%	4.4823

Soil Mapping Unit	% Na T CEC	% Influence	Contribution to the Whole
2	4.6	4.4	0.2024
3B	10.2	5.9	0.6018
108	5.6	1.9	0.1064
164A	3.5	32.8	1.1480
164B	7.2	29.3	2.1096
164B2	3.9	12.7	0.4953
214B	2.6	11.0	0.2860
382	3.7	2.0	0.0740
Calculated Prime "B" Horizon		100%	5.0235

Soil Mapping Unit	Zn	% Influence	Contribution to the Whole
2	1.5	4.4	0.0660
3B	2.0	5.9	0.1180
108	1.4	1.9	0.0266
164A	2.6	32.8	0.8528
164B	7.5	29.3	2.1975
164B2	2.3	12.7	0.2921
214B	1.6	11.0	0.1760
382	1.5	2.0	0.0300
Calculated Prime "B" Horizon		100%	3.759

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Calculated Prime "B" Horizon  
Chemical and Physical Soil Analysis  
Sheet No. 7

Soil Mapping Unit	Mn	% Influence	Contribution to the Whole
2	14	4.4	0.616
3B	6	5.9	0.354
108	14	1.9	0.266
164A	22	32.8	7.216
164B	11	29.3	3.223
164B2	14	12.7	1.778
214B	21	11.0	2.310
382	17	2.0	0.340
Calculated Prime "B" Horizon		100%	16.103

Soil Mapping Unit	Fe	% Influence	Contribution to the Whole
2	31	4.4	1.364
3B	38	5.9	2.242
108	36	1.9	0.684
164A	66	32.8	21.648
164B	62	29.3	18.166
164B2	74	12.7	9.398
214B	51	11.0	5.610
382	72	2.0	1.440
Calculated Prime "B" Horizon		100%	60.552

Soil Mapping Unit	Cu	% Influence	Contribution to the Whole
2	1.6	4.4	0.0704
3B	1.8	5.9	0.1062
108	1.6	1.9	0.0304
164A	1.8	32.8	0.5904
164B	1.7	29.3	0.4981
164B2	2.0	12.7	0.2540
214B	1.6	11.0	0.1760
382	1.6	2.0	0.0320
Calculated Prime "B" Horizon		100%	1.7575

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Calculated Prime "B" Horizon  
Chemical and Physical Soil Analysis  
Sheet No. 8

Soil Mapping Unit	% SS	% Influence	Contribution to the Whole
2	0.2	4.4	0.0088
3B	0.2	5.9	0.0118
108	0.2	1.9	0.0038
164A	0.2	32.8	0.0656
164B	0.3	29.3	0.0879
164B2	0.7	12.7	0.0889
214B	0.1	11.0	0.0110
382	0.2	2.0	0.0040
Calculated Prime "B" Horizon		100%	0.2818

Soil Mapping Unit	% Sand	% Influence	Contribution to the Whole
2	13	4.4	0.572
3B	11	5.9	0.649
108	22	1.9	0.418
164A	16	32.8	5.248
164B	18	29.3	5.274
164B2	13	12.7	1.651
214B	18	11.0	1.980
382	25	2.0	0.500
Calculated Prime "B" Horizon		100%	16.292

Soil Mapping Unit	% Silt	% Influence	Contribution to the Whole
2	56	4.4	2.464
3B	60	5.9	3.540
108	61	1.9	1.159
164A	53	32.8	17.384
164B	53	29.3	15.529
164B2	55	12.7	6.985
214B	52	11.0	5.720
382	58	2.0	1.160
Calculated Prime "B" Horizon		100%	53.941

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Calculated Prime "B" Horizon  
Chemical and Physical Soil Analysis  
Sheet No. 9

Soil Mapping Unit	% Clay	% Influence	Contribution to the Whole
2	31	4.4	1.364
3B	29	5.9	1.711
108	17	1.9	0.323
164A	31	32.8	10.168
164B	29	29.3	8.497
164B2	32	12.7	4.064
214B	30	11.0	3.300
382	17	2.0	0.340
Calculated Prime "B" Horizon		100%	29.767

Revised 8/5/85

Summary Sheet Burning Star No. 4 Mine East of Jamestown

Chemical & Physical Soil Analysis for "B" Horizon  
Weighted Averages

No. of Sample Sites	% OM	P <sub>1</sub> ppm	P <sub>2</sub> ppm	K ppm	Mg ppm	Ca ppm	Na ppm	Soil pH	H/pH	Total CEC	Total CEC	% Base Saturation					% Na T.CEC	Zn ppm	Mn ppm	Fe ppm	Cu ppm	SS	Partical Size Analysis		
												%K	%Mg	%Ca	%H	%Na							% Sand	% Silt	% Clay
26	0.3	20	33	85	446	1133	249	4.9		19.8	19.26	1.0	17.0	30.3	47.2	4.5	5.0	3.8	16	61	1.8	0.3	16	54	30

% OM = % Organic Matter  
P<sub>1</sub> = Available Phosphorus or Bray-1  
P<sub>2</sub> = Reserve Phosphorus or Bray-2  
K<sup>2</sup> = Extractable Potassium

Total CEC = Ammonium Acetate Method CEC  
% Base Saturation  
 $\frac{\text{Meq Cation}}{\text{Meq CEC}} \times 100$

Mg = Magnesium  
Ca = Calcium  
Na = Sodium  
Soil pH  
H/pH = Hydrogen Ion Concentration/  
converted to soil pH  
H meq  
CEC = Cation Exchange Capacity ( sum of bases + H<sup>+</sup> )  
Partical Size Analysis  
% Sand  
% Silt  
% Clay

% Na/T. CEC  
Zn = Zinc  
Mn = Manganese  
Fe = Iron  
Cu = Copper  
SS = Soluble Salts

P<sub>1</sub>, P<sub>2</sub>, K, Mg, Ca, Na, H, Zn, Mn, Fe, and Cu are in parts per million (ppm)  
H<sup>+</sup> Meq and CEC are in Meq/100 grams soil  
SS is in mmhos/cm  
H is in Moles/Liter

Revised 8/5/85

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Summary Sheet Burning Star No. 4 Mine East of Jamestown Road Deep Cores Only  
Chemical & Physical Soil Analysis for B/C Mix

Soil			B/C	Chemical & Physical Soil Analysis for B/C Mix																		Partical Size							
Sample	Mapping	Sample	Mix	%	P <sub>1</sub>	P <sub>2</sub>	K	Mg	Ca	Na	Soil	H/pH	Total		% Base Saturation		% Na	Zn	Mn	Fe	Cu	Analysis							
Site #	Unit	Depth	Depth	OM	ppm	ppm	ppm	ppm	ppm	ppm	pH		CEC	CEC	% K	% Mg	% Ca	% H	% Na	ppm	ppm	ppm	ppm	SS	%Sa	%Si	%Cl		
139	164A	0-26'	1-16'	0.2	20	40	88	730	1750	213	5.8	13.02	4.9	26.1	15.86	1.0	27.1	39.6	28.3	4.0	5.9	3.3	22	57	2.2	0.4	26	44	30
140	214B	0-18'	1-10'	0.3	40	53	180	290	2150	32	6.2	1.36	5.9	15.8	12.57	2.9	15.5	68.3	12.4	0.9	1.1	5.2	10	88	2.2	0.1	20	48	32
141	8500S	0-26'	1-20'	0.2	8	24	105	640	1570	186	6.5	2.97	5.5	17.3	13.72	1.5	32.3	47.2	14.0	5.0	5.9	3.3	16	104	2.5	0.2	22	53	25
142	214B	0-26'	1-14'	0.2	16	35	99	1015	1600	446	6.7	1.79	5.8	21.7	10.45	1.2	39.5	37.3	12.6	9.4	18.6	2.9	8	55	2.0	0.3	30	39	31
143	108	0-26'	1-26'	0.2	21	36	82	354	2240	187	6.7	5.58	5.3	15.7	10.59	1.5	21.2	56.9	14.6	5.8	7.6	2.8	44	105	2.5	0.3	17	64	19
144	164B	0-30'	1-14'	0.2	20	29	117	710	1450	118	5.1	7.04	5.2	23.7	19.02	1.3	25.0	30.8	40.0	3.1	2.7	3.8	17	73	1.9	0.1	22	41	37
145	164B	0-30'	1-12'	0.2	25	45	114	745	1250	227	5.3	6.13	5.2	23.5	18.59	1.3	28.4	29.2	35.4	5.7	6.5	3.4	17	74	2.1	0.1	24	44	32
146	382	0-25'	1-4'	0.8	8	12	50	215	1200	101	5.4	0.65	6.2	12.0	8.31	1.1	15.4	51.2	28.5	3.8	5.3	1.8	34	65	2.3	0.4	12	70	18
147	382	0-18'	1-12'	0.4	10	18	80	375	1475	142	6.1	1.60	5.8	13.5	9.22	1.5	22.5	54.6	16.9	4.5	6.7	2.9	26	74	2.4	0.4	32	50	18
148	382	0-18'	1-14'	0.2	16	25	101	516	1730	424	7.8	0.04	7.4	15.1	12.73	1.7	27.9	57.5	0.4	12.5	14.5	3.7	27	113	2.7	0.4	15	57	28
149	382	0-23'	1-6'	0.5	9	15	78	325	1450	58	6.7	0.06	7.2	10.9	8.81	1.9	24.3	67.5	4.0	2.3	2.8	2.7	15	76	1.9	0.2	34	45	19
150	214B	0-30'	1-20'	0.1	9	20	100	820	1475	225	6.6	1.81	5.7	18.2	13.54	1.4	38.1	43.0	12.1	5.4	7.2	2.9	17	96	2.0	0.2	23	49	28
151	164B	0-30'	1-30'	0.2	7	25	98	625	3460	184	6.9	4.30	5.4	26.0	12.01	1.2	25.0	59.5	10.5	3.8	6.7	2.1	38	58	1.8	0.4	28	45	27
152	164B	0-28'	1-6'	0.3	30	54	114	735	700	199	4.7	5.31	5.3	23.5	18.98	1.3	28.3	15.6	50.3	4.5	4.6	3.7	16	79	2.8	0.2	16	51	33
153	165	0-30'	1-30'	0.2	6	15	98	526	3900	129	7.1	3.39	5.5	27.3	10.29	1.1	19.9	65.4	11.1	2.5	5.4	2.0	54	31	1.5	0.5	26	46	28
154	503	0-30'	1-30'	0.3	6	13	108	662	3000	155	7.1	1.66	5.8	22.7	11.40	1.4	27.7	60.2	7.3	3.4	5.9	2.5	32	49	1.0	0.5	31	40	29
155	164B2	0-26'	1-5'	0.3	21	43	124	533	1250	303	5.1	19.21	4.7	24.7	20.13	1.3	23.0	28.1	41.3	6.3	6.6	3.8	19	79	2.6	0.3	16	46	38
156	912B2	0-26'	1-8'	0.3	3	7	103	533	1500	224	6.2	4.37	5.4	15.7	13.70	1.7	28.3	47.7	16.1	6.2	7.1	2.0	6	25	1.4	0.3	25	45	30
157	2	0-21'	1-12'	0.4	20	33	134	679	1850	77	5.5	5.88	5.2	22.6	16.72	1.5	26.2	43.2	27.5	1.6	2.0	2.5	16	55	2.3	0.2	20	49	31
158	108	0-30'	1-12'	0.5	5	22	71	423	1550	204	6.8	0.74	6.1	13.1	11.45	1.4	27.0	59.3	5.5	6.8	7.8	4.8	19	102	2.2	0.4	22	53	25
159	912A	0-30'	1-12'	0.2	6	31	102	574	2150	250	6.6	1.29	5.9	18.9	15.46	1.4	25.9	58.5	8.2	6.0	7.1	3.2	18	63	2.3	0.2	21	44	35
B/C Mix				0.3	15	28	102	577	1843	197	6.2	4.20	5.4	19.4	13.50	1.5	26.1	48.6	18.9	4.9	6.6	3.1	22	72	2.1	0.3	23	49	28

% OM = % Organic Matter

P<sub>1</sub> = Available Phosphorus or Bray-1

P<sub>2</sub> = Reserve Phosphorus or Bray-2

K = Extractable Potassium

Total CEC = Ammonium Acetate Method CEC

% Base Saturation

$\frac{\text{Meq Cation}}{\text{Meq CEC}} \times 100$

Mg = Magnesium

Ca = Calcium

Na = Sodium

Soil pH

H/pH = Hydrogen Ion Concentration/

converted to soil pH

CEC = Cation Exchange Capacity (sum of bases + H)

Particulate Size Analysis

% Sa = Sand

% Si = Silt

% Na/T, CEC

Zn = Zinc

Mn = Manganese

Fe = Iron

Cu = Copper

SS = Soluble Salts

P<sub>1</sub>, P<sub>2</sub>, K, Mg, Ca, Na, H, Zn, Mn, Fe, and Cu are in parts per million (ppm)

CEC are in Meq/100 grams soil

SS is in mmhos/cm

H is in Moles/Liter

Revised 8/5/85

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Summary Sheet Burning Star No. 4 Mine East of Jamestown - 4 Feet & Deep Cores

Chemical & Physical Soil Analysis for B/C Mix  
Also Note Prime "B" data listed below

	% OM	P <sub>1</sub> ppm	P <sub>2</sub> ppm	K ppm	Mg ppm	Ca ppm	Na ppm	Soil pH	H/pH	CEC	Total CEC	% Base Saturation					% Na T.CEC	Zn ppm	Mn ppm	Fe ppm	Cu ppm	SS	Partical Size Analysis		
												%K	%Mg	%Ca	%H	%Na							% Sand	% Silt	% Clay
B/C Mix	0.3	15	28	102	573	1843	197	6.2	5.4	19.4	13.50	1.5	26.1	48.6	18.9	4.9	6.6	3.1	22	72	2.1	0.3	23	49	28
Prime "B"	0.3	20	33	85	446	1133	249	4.9		19.8	19.26	1.0	17.0	30.3	47.2	4.5	5.0	3.8	16	61	1.8	0.3	16	54	30

% OM = % Organic Matter

P<sub>1</sub> = Available Phosphorus or Bray-1

P<sub>2</sub> = Reserve Phosphorus or Bray-2

K = Extractable Potassium

Total CEC = Ammonium Acetate Method CEC

% Base Saturation

$\frac{\text{Meq Cation}}{\text{Meq CEC}} \times 100$

Meq CEC

Mg = Magnesium

Ca = Calcium

Na = Sodium

Soil pH

H/pH = Hydrogen Ion Concentration/  
converted to soil pH

H meq

CEC = Cation Exchange Capacity ( sum of bases + H<sup>+</sup>)

Partical Size Analysis

% Sand

% Silt

% Clay

% Na/T. CEC

Zn = Zinc

Mn = Manganese

Fe = Iron

Cu = Copper

SS = Soluble Salts

P<sub>1</sub>, P<sub>2</sub>, K, Mg, Ca, Na, H, Zn, Mn, Fe, and Cu are in parts per million (ppm)

H<sup>+</sup> Meq and CEC are in Meq/100 grams soil

SS is in mmhos/cm

H is in Moles/Liter

Revised B/5/85



4. If the information is available, the applicant must include acreage totals of each map unit (soil type and slope classification) of the prime farmlands.

Prime Farmland Acreage Totals by Map Units

Map Unit	Soil Type		Capability Group	Slope	Acreage Total (Acres)
2	Cisne		III W	A	3.2
3B	Hoyleton Silt Loam	2-4% Slopes	II E	B	4.3
108	Bonnie Silt Loam	0-2% Slopes	III W	A	1.4
164A	Stoy Silt Loam	0-2% Slopes	II W	A	24.1
164B	Stoy Silt Loam	2-4% Slopes	II E	B	21.5
164B2	Stoy Silt Loam	2-6% Slopes	II E	B	9.3
214B	Hosmer Silt Loam	2-5% Slopes	II E	B	8.1
382	Belknap Silt Loam		II W	A	1.5
Summary					73.4 Ac.

Revised 8/5/85

## B. Mining Operations

1. Describe the equipment to be used in the removal and replacement of each soil horizon. Include a discussion as to how compaction will be held to a minimum.

Prior to mining the area, the topsoil will be removed by scrapers and directly placed and/or stockpiled. The texture material composed of a mixture of "B" and "C" horizon material (mainly "C" horizon) will be removed by the overburden stripper and placed on top of the spoil material. The area will be graded by bulldozers.

If needed, additional scraper hauled texture material (B and C horizons only) will be hauled in from the highwall.

The B/C mix root medium will be limited to the depths indicated on the attached "suitable material for B/C mix map"; thus, there will be no potential for material other than B or C horizon being incorporated into the mix.

After approval of the texture material by the regulatory authority, the topsoil shall be redistributed to a uniform depth with scrapers and dozers.

SUMMARY OF THE COMPARISON OF PRIME TOPSOIL  
VERSUS  
NON-PRIME TOPSOIL

Burning Star No. 4 Mine

PARAMETER	65.6% PRIME TOPSOIL (MEAN)	34.4% (% of Permit Area) NON-PRIME TOPSOIL (MEAN)	COMMENTS
Straight Line Soil pH average	6.0	5.8	In our restored prime farm- land fertility program, we propose to maintain an average pH level of 6.0.
Percent Organic Matter	1.7	1.8	- - - - -
Available Phosphorus BRAY-1	17	16	The available reserve phos- phorus levels are lower in the nonprime topsoil. In our restored prime farmland fertility program, we pro- pose to maintain an average P-1 test of 25 ppm.
Reserve Phosphorus BRAY-2	33	29	
Extractable Potassium	70	102	In our restored prime farm- land fertility program we propose to maintain an average K test of 130 ppm.
Percent Sand	15	14	Nonprime topsoil averages 4% more clay than prime topsoil. This difference should not prohibit mixing of prime and nonprime topsoil.
Percent Silt	62	59	
Percent Clay	23	27	
Texture Classification	Silt Loam	Silt Loam	
Cation Exchange Capacity, Meq/100 grams soils	10 Meq	13 Meq	

Revised 8/5/85

Soil Mapping Unit	Number of Sample Sites	Average Topsoil Depth (Entire Permit Area)	% of Influence (Entire Permit Area)	Inches of Topsoil this Soil Mapping Unit Contributed to the Whole (Topsoil Removal Only)	Inches of Topsoil this Soil Mapping Unit Contributed to the Whole 6" Removal Min. All Areas 8" Removal Min for Prime & High Capability Soil Mapping Units	
2	26	12.8"	2.7%	0.35"	0.35"	--
3A	2	13.5"	0.2%	0.03"	0.03"	--
3B	14	9.1"	1.8%	0.16"	0.16"	
5C3	37	5.2"	4.5%	0.23"	0.27"	(+0.04")
5D	6	4.5"	0.5%	0.02"	0.03"	(+0.01")
5D3	14	3.9"	1.0%	0.04"	0.06"	(+0.02")
8E	22	4.5"	1.4%	0.06"	0.08"	(+0.02")
8E3	3	5.3"	0.2%	0.01"	0.01"	(+ None)
108	72	7.4"	8.5%	0.63"	0.68"	(+0.05")
164A	61	10.5"	7.6%	0.80"	0.80"	--
164B	116	9.8"	11.0%	1.08"	1.08"	--
164B2	22	8.4"	3.6%	0.30"	0.30"	--
165	50	10.2"	6.0%	0.61"	0.61"	--
214B	45	9.1"	4.0%	0.36"	0.36"	--
214C <sub>3</sub>	84	5.2"	8.7%	0.45"	0.52"	(+0.07")
382 <sup>3</sup>	196	9.1"	25.4%	2.31"	2.31"	--
787	7	9.6"	0.8%	0.08"	0.08"	--
850D <sub>3</sub>	48	3.9"	4.4%	0.17"	0.26"	(+0.09")
900E <sub>3</sub>	5	4.8"	0.3%	0.01"	0.02"	(+0.01")
912A	12	13.1"	1.4%	0.18"	0.18"	--
912B <sub>2</sub>	45	6.9"	4.7%	0.32"	0.38"	(+0.06")
1108 <sup>2</sup>	6	3.0"	0.5%	0.02"	0.03"	(+0.01")
Water	--		0.8%	--		
	893		100%	8.22"	8.60"	(+0.38")

(Revised 1/30/86)

V(13) C Bonnie Creek Temporary Relocation

Discussion

The Temporary Relocation was designed to minimize the upstream and downstream effects on Bonnie Creek. The length of the proposed temporary relocation is approximately 15,450 feet and is located within the project area as shown on Drawing VC-1. The relocated channel will be constructed with 2H:1V side slopes and have a bottom width of 10 feet. Drawing VC-3 and Drawing VC-2 detail the profile and cross sections of the proposed temporary channel. Construction of the temporary channel will require the excavation of approximately 831,000 cubic yards of earth. The construction will disturb a total of 93 acres of which 67.5 acres will contribute runoff to the temporary channel and the proposed stilling basin. The stilling basin will be constructed at the downstream end of the temporary channel prior to the channel's excavation. The stilling basin is designed to trap any sediment occurring from the 67.5 disturbed diversion channel acres that may occur prior to establishing permanent vegetative cover.

No modifications are proposed to the existing stream below the temporary Bonnie Creek relocation stilling pond. Looking at the velocities, Volume V, Exhibit C-1, page 005, Sec. No. 1000-5000, the velocity of this section is predicted to be less than 3.4 feet per second. This channel velocity should not result in any erosional or stability problems.

The cross-sections of this stretch of original channel, Volume V, page 2, HEC 2 input file, X1001-1005, closely approximate the proposed temporary upstream relocation cross-sections. Thus, this section of the channel will be adequate to meet the estimated flow requirements of Bonnie Creek.

A minimum of 141 acres of riparian habitat will be re-established along the permanent restoration channel (see Land Reclamation Plan, Map E). The overbank areas will be developed so that riparian habitat may be established. The width of the overbanks will vary along each side of the channel. However, the overbanks will have an average width of 430 feet. When required, the spoil will be graded to maintain a minimum width of 250 feet with slopes rising from the flood plain at a maximum slope of 4H:1V, as shown in Figure 5D-3. Please refer to Figure 5D-4 for a map outlining the existing Bonnie Creek "Riparian" Zone. Please note the "Riparian" Zone does not represent present riparian habitat acreage.

The permanent restoration will be constructed by developing the channel in the low areas running parallel to the spoil peaks and also in naturally occurring depression areas in the spoil. This method of relocating the stream will enable meanders to be created so that an equivalent stream length can be established. Fifteen (15) meanders are proposed as sufficient for re-establishment of original stream length.

Consol will attempt to re-establish the restored channel so as to approximate, as close as possible, the existing channel. However, the location and dimensions shown are typical representations of the restored channel and do not represent the precise configuration of the permanent restored stream. As discussed, final restored locations and dimensions are mainly controlled by spoil placement and the location of depression areas.

Another concern is the transition of the existing channel into the restored channel. A smooth transition is proposed at this location to maintain natural stream conditions. The channel width may be increased at this site to create a gradual transition zone that will maintain a more steady stream flow condition. Rip-rap will be provided if it is needed to prevent erosion.

In addition, where practical, depression areas adjacent to the permanently restored channel may be developed into wetlands (marsh) habitat.

From reclamation efforts already completed on the permanent Galum Creek channel restoration, we are finding that numerous pool-riffle sequences are established due to depressions in the spoil. Four (4) ~~Although no exact number can be specified, a series of these riffle/pool sequences~~ structures will be re-established on Bonnie Creek. State agency personnel will be invited on a regular basis to review reconstruction efforts on the creek to insure their satisfaction with restoration efforts.

#### Habitat Improvement Structures

In order to improve aquatic macroinvertebrates and vertebrates habitat in the restored channel, we propose to construct habitat improvement structures; namely, single-boulder deflectors and multiple-boulder deflectors.

(Revised 1/30/86)

Everhart (1971) suggested habitat alterations such as "various in-stream devices to make pools, provide cover, increase water velocity and wash out silt". Roundsefell and Evarhart (1953) state, "Deflectors are primarily designed to speed up the current, thus washing out silt and providing graveled riffle areas. Increasing the speed of the current gives the water less chance for long exposure to the sun and helps to maintain the usually desired low temperature". Finally, Gore and Johnson (1979) have found that areas around large inundated boulder rip-rap were their primary collecting point for some game fish.

Single-boulder deflectors are intended to "speed up current in wide, shallow pools", and will provide cover for fish populations.

Multiple-boulder deflectors are considered to be "one of the easiest of the improvement devices to construct and the most rewarding". Once again, they will serve to produce eddy currents to provide movement in pools.

Additional instream habitat structures include current deflectors, check dams and anchored brush shelters.

Current deflectors can be constructed with boulders or logs. Boulders being the more permanent of the two, will be the most practical for the Bonnie Creek restoration. When constructed in alternating sequence they serve to reproduce the meandering current found in a natural stream channel.

Successful check dams are generally placed in straight sections of narrow channel. With the proposed meandering of the Bonnie Creek Channel, the use of check dams would not appear practical. Check dams as recommended by the U. S. Forest Service, Wildlife Habitat Improvement Handbook, Catalog No. FSH 2609.11, August 1969, should be limited to streams having flows of 100 cfs or less. Therefore, check dams are not proposed for the Bonnie Creek restoration.

Anchored brush shelters are primarily used in reservoir situations. They would not appear to be practical as an instream habitat. The variable water elevations of a stream would subject the brush shelter to repeated wetting and drying, increasing the likelihood of failure and decreasing its useful life. Anchored brush shelters are not proposed for the Bonnie Creek restoration.

The number and placement of these structures will be determined during construction of the restored channel in consultation with the Regulatory Authority.

Fifteen (15) habitat improvement structures, as described above, will be installed in the restored creek channel (single and multiple boulder deflectors and current deflectors). Specific locations will be determined following restoration of the creek channel in consultation with the Department.

(Revised 1/30/86)

## Revegetation

The final creek restoration will be accomplished concurrently with the field's reclamation obligations. Thus, the final creek restoration should be completed prior to the completion of mining in the field. The channel banks and proposed 141 acres of lowland or riparian habitat zone will be vegetated with the following species in an effort to guarantee successful reclamation:

### Herbaceous Cover

Alsike Clover (A)	7 lbs/ac	(A) to be inoculated with species inoculant not more than 60 days prior to planting.
Red Top	10	(B) Serecea lespedeza to be planted in spring only; in fall the clover seeding rate will be doubled.
Perennial ryegrass	10	
Serecea lespedeza (A) (B)	7	(C) Wheat to be used in fall planting; oats in spring.
Wheat or oats (C)	<u>25</u>	
TOTAL	59 lbs/ac.	



### Trees

Black alder	Hickory	(D) To be planted as a border
Red Oak	Cottonwood	planting.
Green ash	Silver maple	
Burr Oak	Blackgum	
<del>Autumn olive</del> (D)	Pin oak	
White oak	Redbud	
River birch	Sycamore	
Black walnut	Sweetgum	
Bald cypress		

Trees will be planted on a 6' x 6' spacing; resulting in a planting density of approximately 961 trees per acre. Tree species may vary according to stock available at planting time. Any substitute species will be approved by the Regulatory Authority.

### Biological Monitoring Program

The proposed biological monitoring program consists of sampling benthic macroinvertebrate and fish populations in the Bonnie Creek diversion.

Three (3) ~~several~~ sampling stations with different substrates will be selected in consultation with the Illinois Department of Conservation and be sampled on a quarterly basis. Substrate type, water depth, temperature of air and water, current velocity, stream pH and dissolved oxygen levels will be noted. Water samples will be taken and returned to the laboratory for testing of those parameters listed in Schedule A.

Benthic macroinvertebrates will be sampled using a dredge, grab or core device, and with a bottom dip net and hand picking. Samples will be passed through a U.S. Standard No. 30 Sieve immediately, and resulting material will be identified to a family level using a dissecting stereomicroscope and a compound microscope.

Fish populations will be sampled using a 10' seine, a 20' bag seine, dip netting and/or electro-shocking. Species will be identified and released, if possible. Smaller species (ex. Notropis) may be preserved and returned to the laboratory for identification.

Sampling will continue until bond release. Results of the sampling will be reported to the Regulatory Authority within 30 days of the end of each calendar quarter (April 30, July 30, October 30, January 30).

Approval from the Illinois Department of Mines and Minerals will be requested prior to routing Bonnie Creek through the temporary channel.

(Revised 1/30/86)

## Hydraulic Model

The 100 year-24 hour storm event permanent restoration water surface profiles and stream storage volumes were developed using the HEC-2 computer program. The starting and terminating locations for the permanent restoration 100 year-24 hour storm event are outlined in the Existing Bonnie Creek Hydraulic Model section. In addition, they are shown on the HEC-2 Cross Section Location Map (Drawing VD-2).

The permanent restoration 100 year-24 hour computer model was developed using the 100 year-24 hour storm event flows from the HEC-I model for the existing Bonnie Creek. Since trying to predict exact flow rates for the restored creek has definite limitations, utilizing flow rates from the existing creek presented the best method for comparing respective surface water profiles and flood storage volumes. Existing cross section data and parameters (for the respective portions of permanently relocated Bonnie Creek and Galum Creek channel sections) were removed from the "existing" Bonnie Creek computer model and replaced with restored channel cross section data and parameters. The Galum Creek flows were modified to reflect flow rates used in the "permanently relocated Galum" model in Permit No. 74. The 100 year-24 hour HEC-2 computer model for the permanently restored Bonnie Creek is included as Exhibit D-2. Drawings VD-3 and VD-4 detail the 100 year flood plain depths and water surface profile.

The permanent restoration 2 year-24 hour computer model was similarly developed from existing Bonnie HEC-I generated stream flows with restored channel cross section data and parameters. The HEC-2 computer model of the 2 year-24 hour storm event is included as Exhibit D-1. Bonnie Creek Permanent Relocation Cross Section Location Map, Drawing VD-1, shows the corss section locations used for modeling the restored Bonnie Creek Channel.

### Storm Event Flows and Velocities

Flow values used in the permanent restoration are identical to flow values in the Bonnie/Galum water system prior to their temporary relocations (as detailed in the Hydraulics Model). These flows were then used in the HEC-II computer model to obtain water surface profiles and flow velocities. The 2 year and 100 year-24 hour storm event flows velocities for the permanent restoration are listed in Tables 5D-1 and 5D-2, respectively.

### Upstream Water Surface Elevation

The location used to evaluate the upstream effects of the Permanent Restoration was approximately 100 feet upstream of State Highway 154 (Station 199 + 50 - Existing Bonnie Creek). The water surface elevation at this location was found to actually decrease under the proposed restoration. The existing stream water surface elevation for a 100 year-24 hour storm event at this location was 452.39 feet and with the permanent restoration water surface elevation being 449.17 feet. This decrease in water surface elevation can be attributed to two conditions resulting from the permanent relocation:

- 1) reduced retardence of flow due to newly planted riparian habitat replacing formerly established riparian habitat.
- 2) slightly increased channel and flood plain gradients in the upper reaches of the permanently restored stream.

Quarterly progress reports will be submitted to the Illinois Department of Mines and Minerals on the permanent Bonnie Creek restoration. Included in these reports will be as-built cross-sections of the channel and floodplain (intervals of 500 feet) and the locations and types of instream habitats.

Approval from the Illinois Department of Mines and Minerals will be requested prior to rerouting Bonnie Creek through the restored channel.

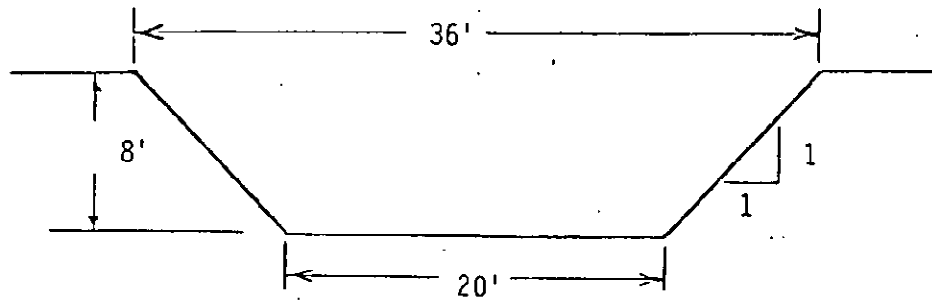
TABLE 5D-3

Bonnie Creek Permanent Relocation  
2 Year-24 Hour Surface Water Profile Depths  
(For Restored Portion of Channel)

<u>Station</u>	<u>Left Overbank</u>	<u>Depth(Ft) Channel</u>	<u>Right Overbank</u>
0 + 01	6.37	14.37	6.37
15 + 00	4.99	12.99	4.99
30 + 00	3.62	11.62	3.62
45 + 00	2.26	10.26	2.26
60 + 00	1.71	9.71	1.71
75 + 00	0.90	8.90	0.90
90 + 00	0.78	8.78	0.78
105 + 00	0.74	8.74	0.74
120 + 00	0.60	8.60	0.60
135 + 00	0.61	8.61	0.60
150 + 00	0.61	8.61	0.60
165 + 00	0.68	8.68	0.68
180 + 00	0.61	8.61	0.61
197 + 05	0.49	8.49	0.49
199 + 50 <sup>*</sup>	2.85	8.25	2.85

<sup>\*</sup> Station 199 + 50 located approximately 100 feet north of State Highway 154.

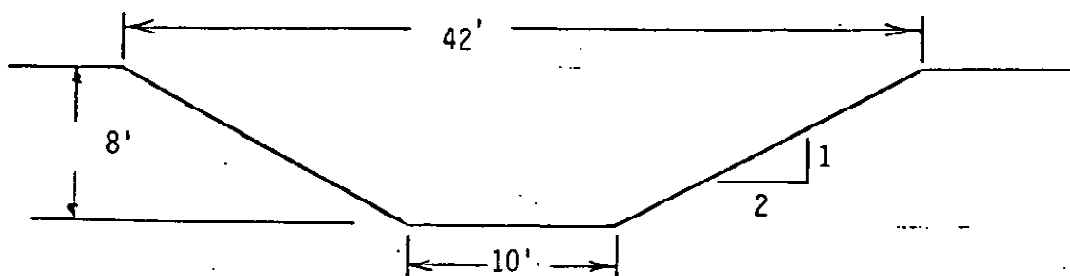
# TYPICAL EXISTING BONNIE CREEK CROSS SECTION



$$A = (20' + (1)(8'))(8')$$

$$A = 224 \text{ ft}^2$$

# TYPICAL PERMANENT BONNIE CREEK CROSS SECTION



$$A = (10' + (2)(8'))(8')$$

$$A = 208 \text{ ft}^2$$

**CONSOLIDATION  
COAL CO.**

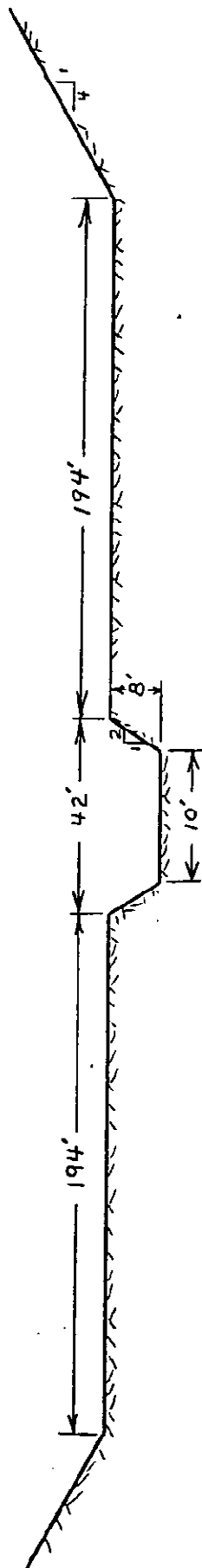
TITLE BONNIE CREEK PERMANENT  
RELOCATION - CROSS SECTIONAL  
AREA COMPARISON

DRAWN BY

CHK'D BY

DRAWING NO.

FIG.  
5 D-2



**CONSOLIDATION  
COAL CO.**

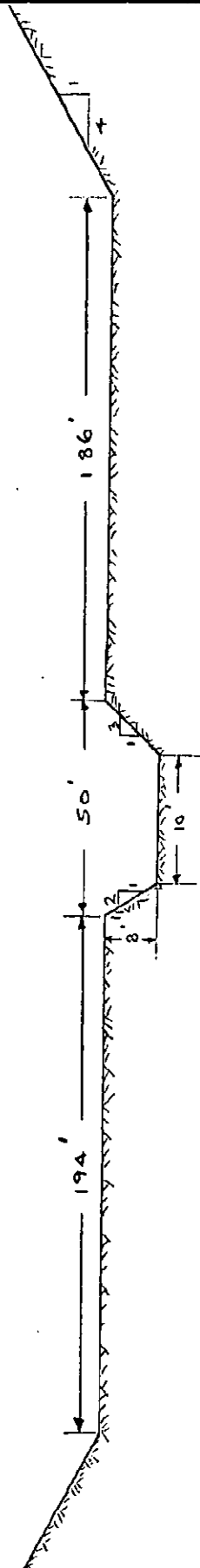
TITLE  
BONNIE CREEK PERMANENT  
RELOCATION - TYPICAL  
CROSS SECTION STRAIGHT

DRAWN BY

CHK'D BY

DRAWING NO.

FIG.  
5D-3



**CONSOLIDATION  
COAL CO.**

**TITLE**

BONNIE CREEK PERMANENT  
RELOCATION TYPICAL BEND  
CROSS SECTION

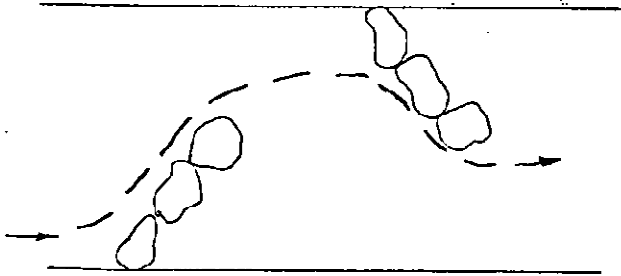
**DRAWN BY**  
MT

**CHK'D BY**

**DRAWING NO.**

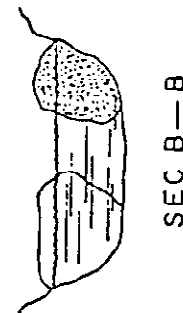
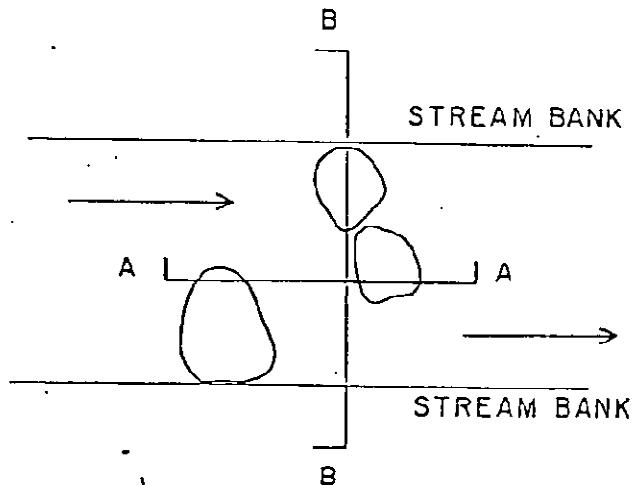
Fig.  
5D-3A

STREAM BANK

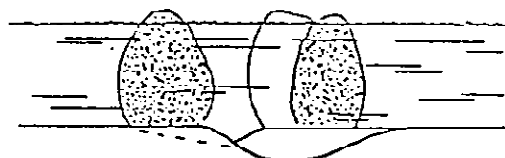


CURRENT DEFLECTOR

STREAM BANK



SINGLE OR MULTIPLE  
BOULDER DEFLECTOR



SEC A-A

CONSOLIDATION COAL COMPANY  
MIDWESTERN DIVISION

HABITAT IMPROVEMENT  
STRUCTURES

DATE 4-80

SCALE

CHKD

REV.

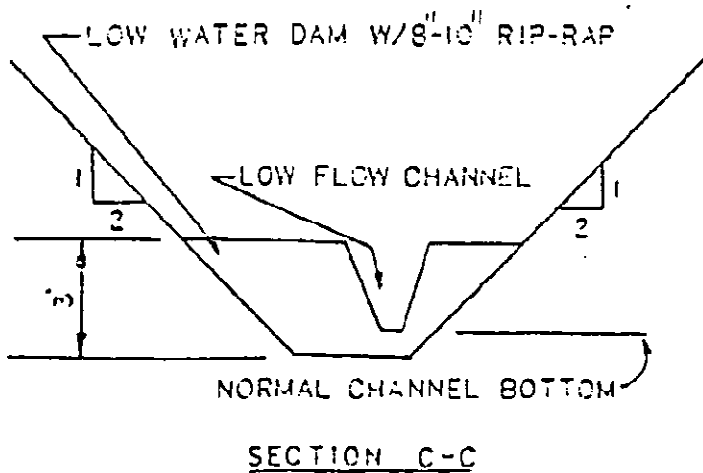
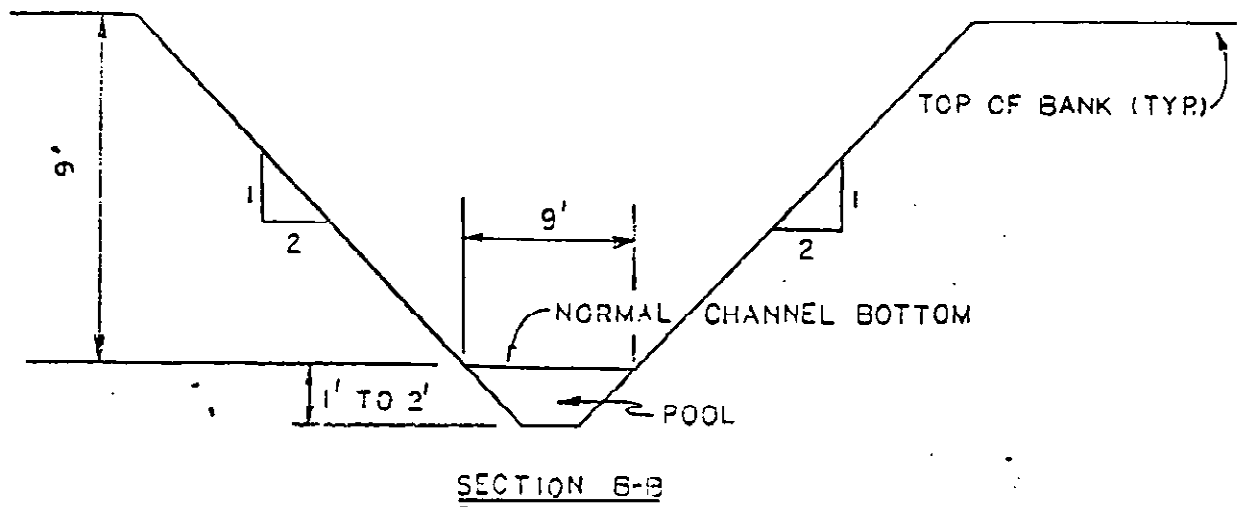
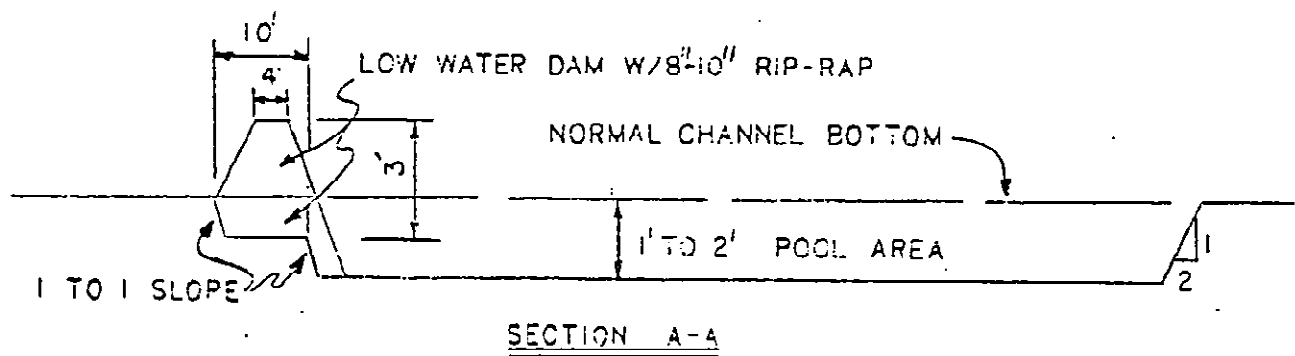
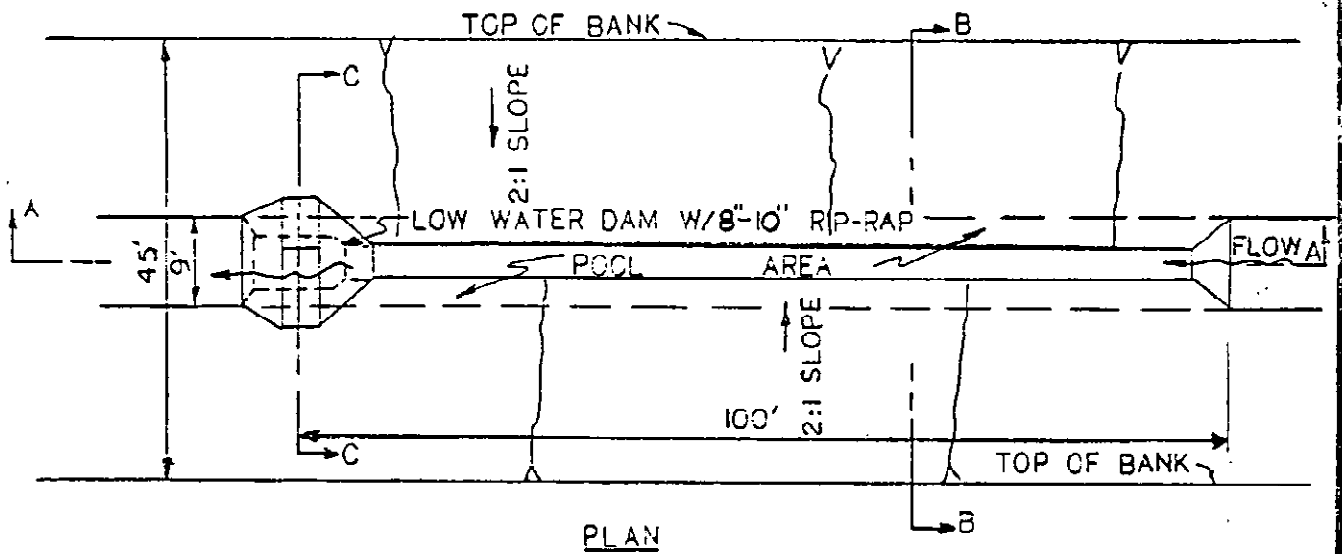
APPD

DRAWING NO.

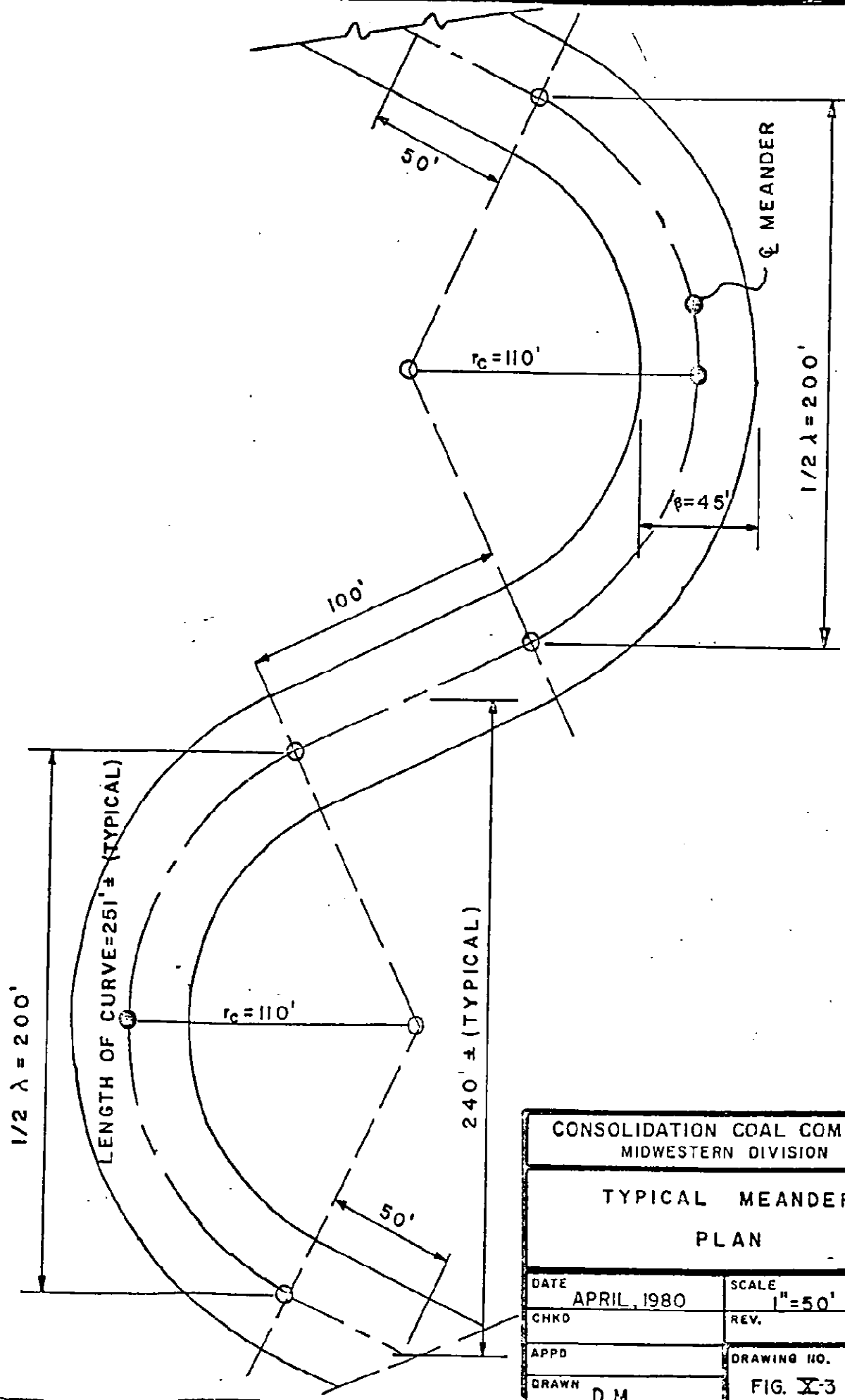
DRAWN

FIG. IX-5

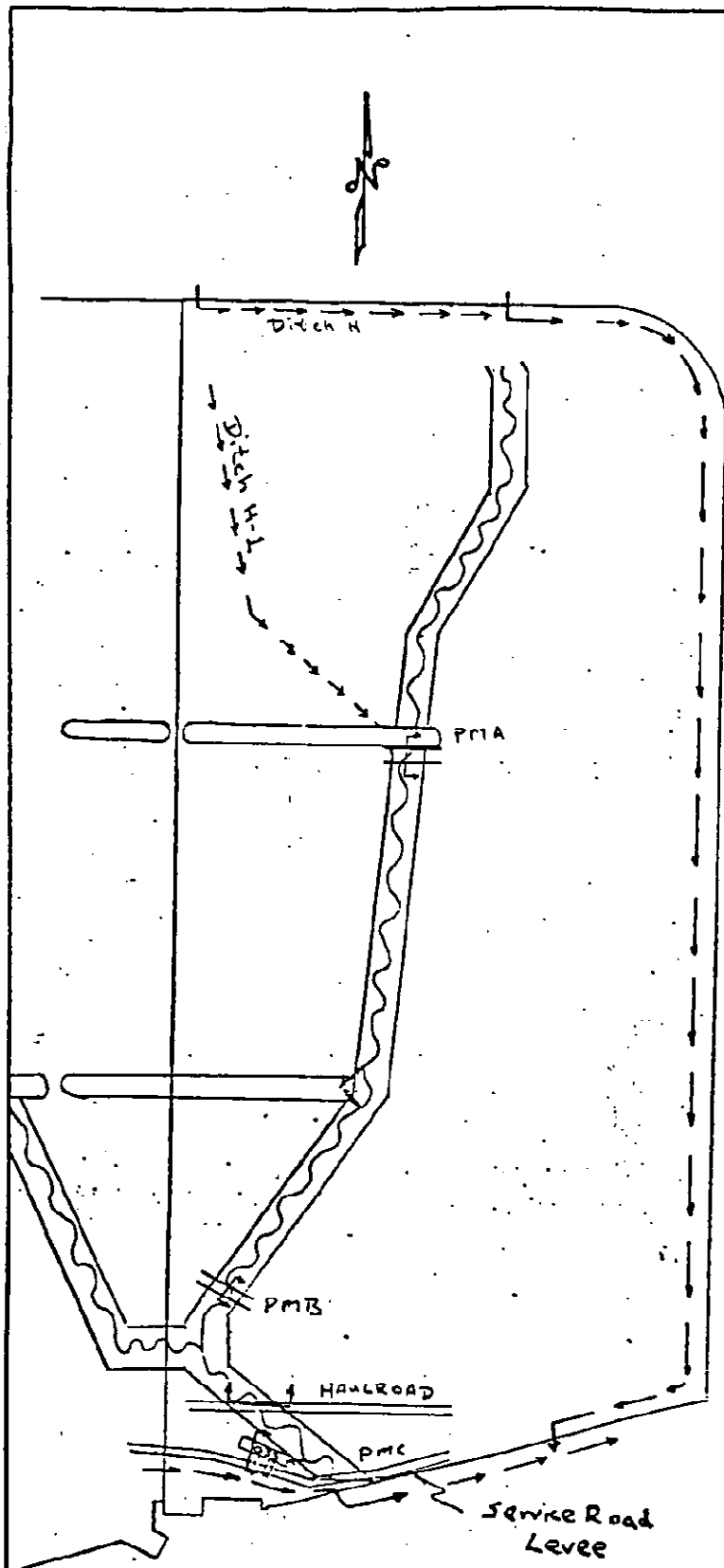




CONSOLIDATION COAL COMPANY MIDWESTERN DIVISION	
POOL - RIFFLE SEQUENCE	
DATE APRIL, 1980	SCALE NONE
CHKD	REV.
APPD	DRAWING NO.
DRAWN	FIG. XX-4



**POST MINING  
DRAINAGE CONTROL**



The post-mining drainage plan consists of a series of levees (PMA), (PMB), & (PMC; service road levee). A haulroad will also be built across the channel.

Tributary drainage will still be handled by Ditch H and the Bonnie Creek diversion.

PMA will store water in the channel and northern most incline. PMB will store water in the channel and southern most incline.

The haulroad culverts are of sufficient capacity so as not to impound water.

PMC will store water in the channel and discharge through pond 033.

During 10 yr - 24 hr storm criterion no water will be stored in the Bonnie Creek restoration flood plain.

This will facilitate establishing vegetation in the floodplain.

Sediment deposition in the channel will be removed and the channel will be restored to design flow line, at such time that the restored creek is being completed and ready to resume Bonnie Creek flow.

CONSOLIDATION  
COAL CO.

TITLE  
Drainage Control for  
Areas Under Reclamation

DRAWN BY

CHK'D BY

DRAWING NO.

## SEDIMENT POND BS 4-9 (PMA)

### Northern Section

#### I. Design Information

Storm Event:	10 yr./24 hr.
Precipitation:	4.9 inches
Drainage Area:	447 Acres
Hydrologic Group:	A
Runoff Curve No.:	75

#### II. Design Volumes

Storm Runoff Volume:

$$(447 \text{ ac}) (0.083 \text{ ac-ft/ac}) = 37.1 \text{ ac-ft}$$

Sediment Storage Volume:

$$(447 \text{ ac})(0.035 \text{ ac-ft/ac}) = 15.6 \text{ ac-ft}$$

$$\text{Total Design Storage Volume} = 52.7 \text{ ac-ft}$$

Minimum Design Surface Area:

$$(447 \text{ ac})(448 \text{ ft}^2/\text{ac}) = 200,256 \text{ ft}^2$$

$$= 4.6 \text{ acres}$$

#### III. Pond Sizing

From elevation versus storage volume graph (following page), the storage volume within the channel at a water depth of 3.3 feet will have a storage volume of 53 acre-feet (52.7 ac-ft needed to meet design volume).

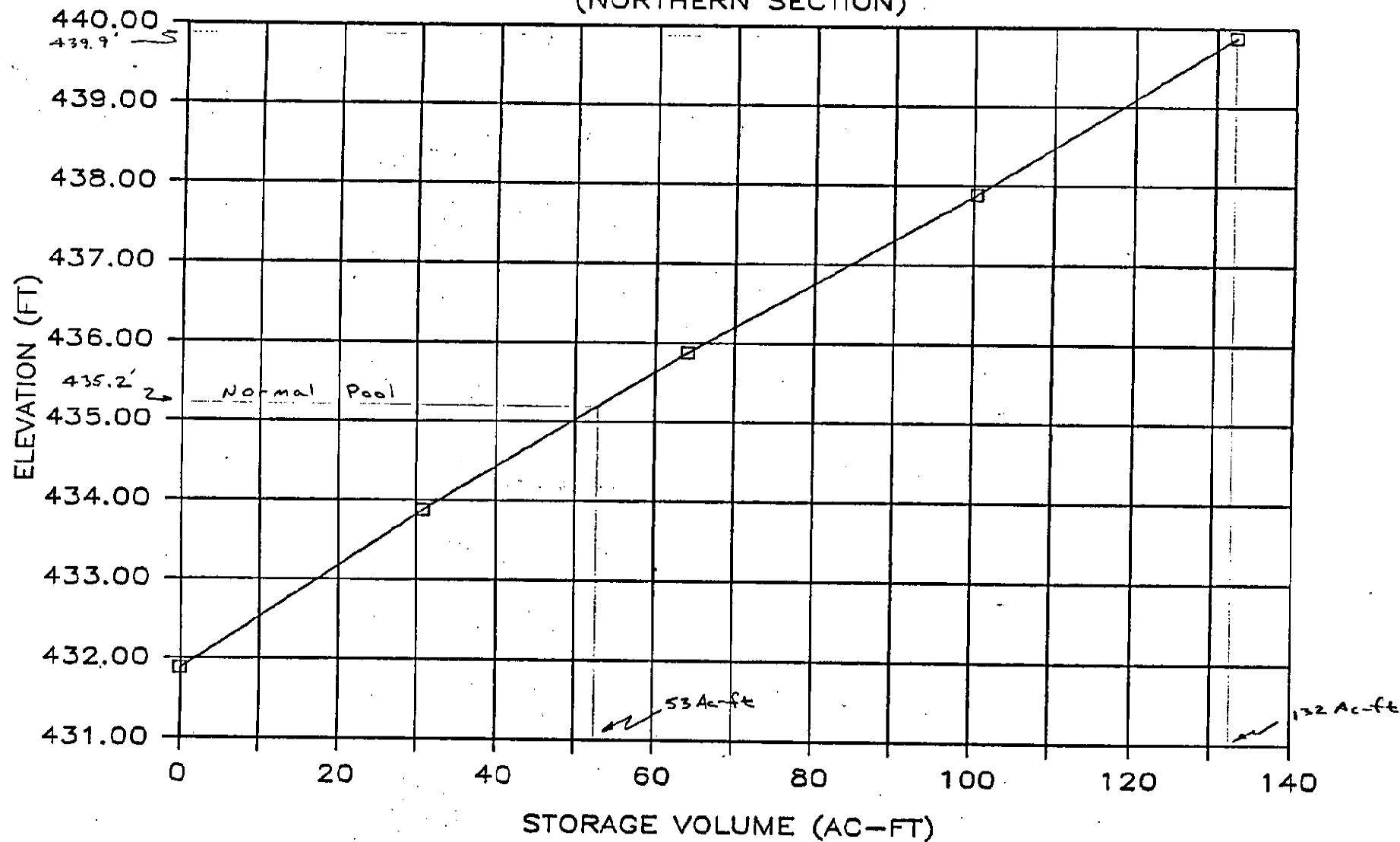
$$\text{Normal Pool Elevation} = 435.2$$

Surface Area:

Approximate surface area of pond is 15.1 acres (>4.6 acres).

# STORAGE VOLUME VS. ELEVATION

(NORTHERN SECTION)



#### IV. Spillway Sizing

CN = 75  
Slopes = Flat  
Precipitations = 4.9 inches  
Drainage Area = 447 acres

##### A. 10 Yr./24 Hr. Storm

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, page 10.21;

Therefore, total runoff volume is

$$V_t = \frac{(447 \text{ acres})(2.3 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 85.7 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ )

From SCS Engineering Field Manual, Chapter 2,  
Page 2-59, Exhibit 2-10;

$$Q_p = 215 \text{ cfs}$$

##### B. 25 Yr./24 Hr. Storm

Precipitation - 5.6 inches

1. Total runoff volume ( $V_t$ ) is:

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, Page 10.21;

Direct runoff from 5.6 inches rainfall is 2.94 inches.

$$V_t = \frac{(447 \text{ acres})(2.94 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 109.5 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ );

From SCS Engineering Field Manual, Chapter 2, Page  
2-65, Exhibit 2-10;

$$Q_p = 270 \text{ cfs}$$

C. Primary Spillway (for 25 yr./24 hr. storm)

From the elevation versus storage volume graph for pond (PMA), a cross valley impoundment with a depth of 3.3 feet would have a storage volume of 53 ac-ft.

$$\text{Normal Pool Elevation} = 435.2 = 53 \text{ ac-ft}$$

$$\text{Maximum Pool Elevation} = 439.9 = 132 \text{ ac-ft}$$

Storage volume during 10 yr./24 hr. design storm ( $V_t$ ) is;

$$V_s = 132 \text{ ac-ft} - 53 \text{ ac-ft} = 79 \text{ ac-ft}$$

$$\text{Total Inflow } (V_t) = 85.7 \text{ ac-ft}$$

$$\text{Peak Inflow } (Q_p) = 270 \text{ cfs}$$

$$\frac{V_s}{V_t} = \frac{79}{85.7} = 0.92$$

Utilizing the Preliminary Hydraulic System Sizing Curve, from D'Appolonia Consulting Engineer's Engineering and Design Manual Coal Refuse Disposal Facilities, page 6.201;

$$\frac{Q_o}{Q_p} = 0.04$$

$$Q_p$$

$$Q_{out} = (270 \text{ cfs}) (0.04)$$

$$Q_{out} = 11 \text{ cfs}$$

From the headwater to diameter charts on the following page, an 18 inch culvert is adequate for the primary outlet.

No emergency spillway is proposed. Primary spillway can handle 25 yr./24 hr. storm.



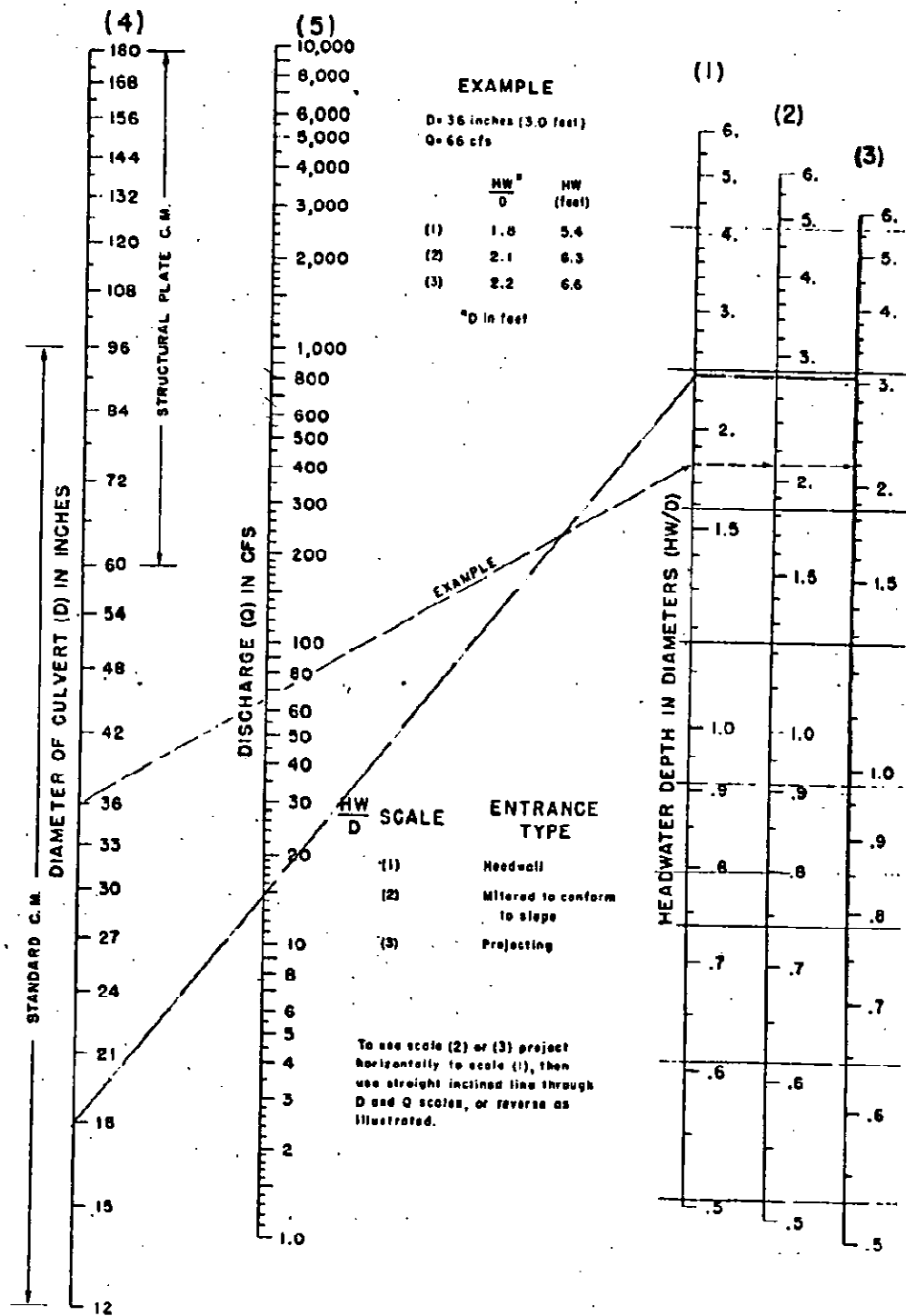


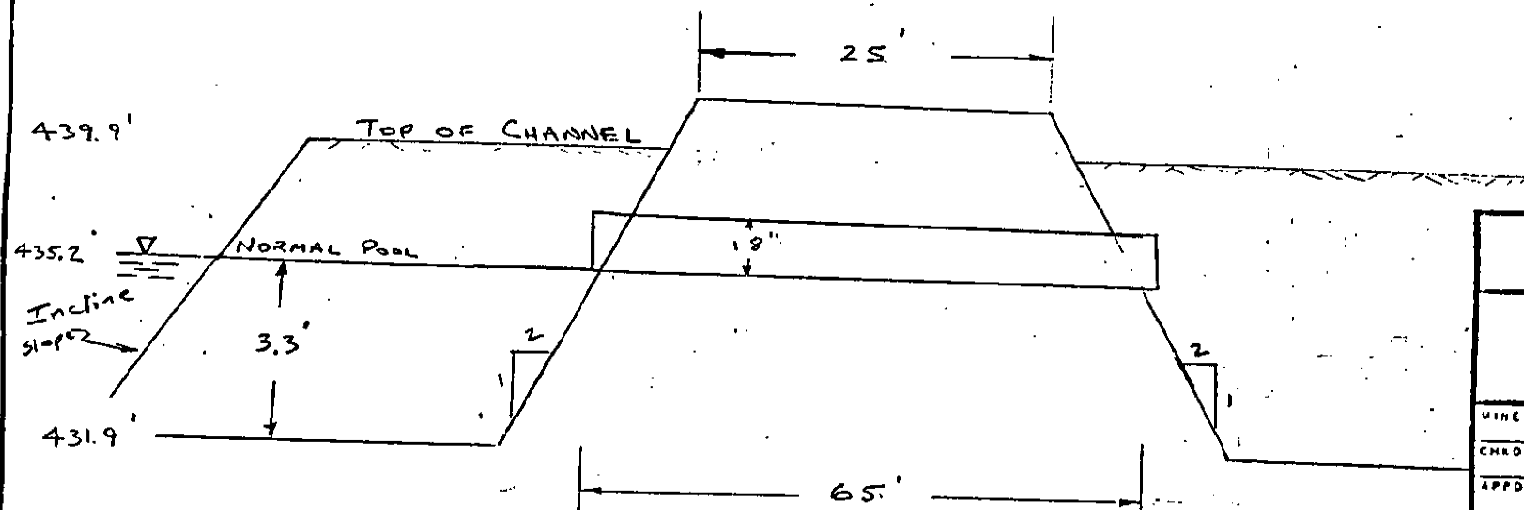
Exhibit 3-10 Headwater depth for CM pipe culverts with inlet control (Ref. Hyd. Eng. Cir. No. 5, USBPR, 1965)

### HYDROLOGIC DATA

Design storm 10 yr - 24 hr  
 Precipitation amount 4.9 (in) Curve number 75  
 Drainage area 447.0 (acres) Pit pumpage        (gpm)  
 Hydrologic soil group A Runoff volume 85.7 (ac-ft)

### IMPOUNDMENT DATA

Sediment volume 15.6 (ac-ft)  
 Surface area at normal pool 15.1 (ac)  
 Volume at normal pool 53.0 (ac-ft)  
 Maximum depth at normal pool 3.3 (ft)



CONSOLIDATION COAL COMPANY  
 MIDWESTERN DIVISION  
 PINCKNEYVILLE, ILLINOIS 62274

### SEDIMENT POND DATA

DAM I.D. NO. PMA

DATE	DATE
CHRD	SCALE
APPD	DRAWING NO.
DRAWN	REV.
SHEET OF	

## SEDIMENT POND BS 4-9 (PMB)

### Middle Section

#### I. Design Information

Storm Event: 10 yr./24 hr.  
Precipitation: 4.9 inches  
Drainage Area: 456.8 Acres + Discharge from PMA  
Hydrologic Group: A  
Runoff Curve No.: 75

#### II. Design Volumes

Storm Runoff Volume:

$$(456.8 \text{ ac}) (0.083 \text{ ac-ft/ac}) = 37.9 \text{ ac-ft}$$

Sediment Storage Volume:

$$(456.8 \text{ ac}) (0.035 \text{ ac-ft/ac}) = \underline{16.0 \text{ ac-ft}}$$

$$\text{Total Design Storage Volume} = 53.9 \text{ ac-ft}$$

Minimum Design Surface Area:

$$\begin{aligned} (456.8 \text{ ac}) (448 \text{ ft}^2/\text{ac}) &= 204,646 \text{ ft}^2 \\ &= 4.70 \text{ acres} \end{aligned}$$

#### III. Pond Sizing

From elevation versus storage volume graph (following page), the storage volume within the channel at a water depth of 6.9 feet will be 55 acre-feet (53.9 ac-ft needed to meet design volume).

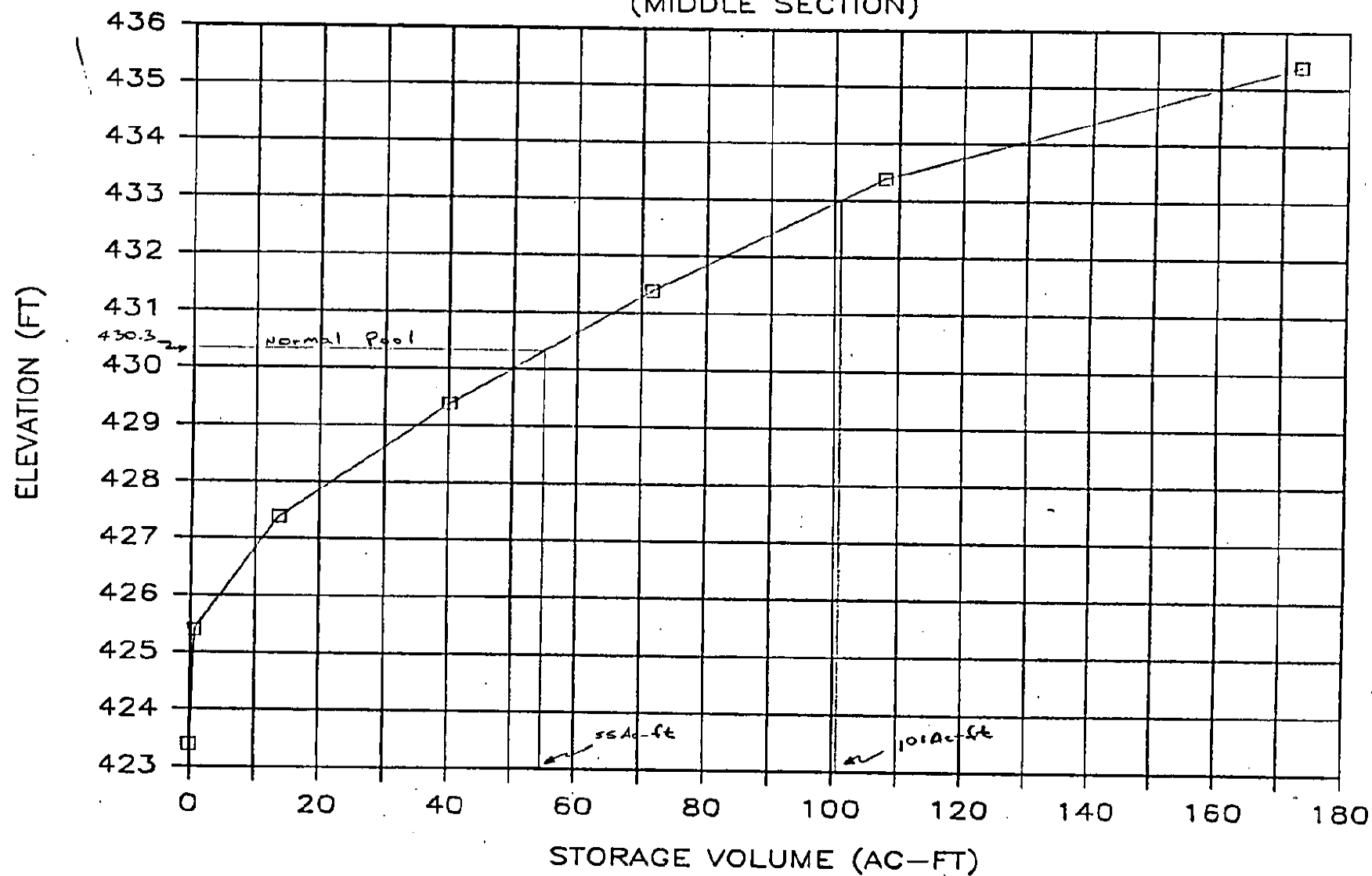
$$\text{Normal Pool Elevation} = 430.3$$

Surface Area:

Approximate surface area of pond is 9 acres (> 4.7 acres).

# STORAGE VOLUME VS. ELEVATION

(MIDDLE SECTION)



#### IV. Spillway Sizing

CN = 75  
Slopes = Flat  
Precipitations = 4.9 inches  
Drainage Area = 456.8 acres

##### A. 10 Yr./24 Hr. Storm

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, page 10.21;

Therefore, total runoff volume is

$$V_t = \frac{(456.8 \text{ acres})(2.3 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 87.6 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ )

From SCS Engineering Field Manual, Chapter 2,  
Page 2-59, Exhibit 2-10;

$$Q_p = 220 \text{ cfs}$$

##### B. 25 Yr./24 Hr. Storm

Precipitation - 5.6 inches

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4,  
Hydrology, Chapter 10, Page 10.21;

Direct runoff from 5.6 inches rainfall is 2.94 inches.

$$V_t = \frac{(456.8 \text{ acres})(2.94 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 112 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ );

From SCS Engineering Field Manual, Chapter 2,  
Page 2-65, Exhibit 2-10;

$$Q_p = 275 + 11 \text{ cfs (discharge from PMA)} = 286$$

C. Primary Spillway (for 25 yr./24 hr. storm)

From the elevation versus storage volume graph for pond (PMB), a cross channel impoundment with a depth of 6.9 feet would have a storage volume of 55 ac-ft.

$$\text{Normal Pool Elevation} = 430.3 = 55 \text{ ac-ft}$$

$$\text{Maximum Allowable Elevation} = 433.5 = 110 \text{ ac-ft}$$

Storage volume during 10 yr./24 hr. design storm ( $V_t$ ) is;

$$V_s = 110 \text{ ac-ft} - 55 \text{ ac-ft} = 55 \text{ ac-ft}$$

$$\text{Total Inflow } (V_t) = 87.6 \text{ ac-ft}$$

$$\text{Peak Inflow } (Q_p) = 275 \text{ cfs}$$

$$\frac{V_s}{V_t} = \frac{55}{87.6} = 0.63$$

Utilizing the Preliminary Hydraulic System Sizing Curve, from D'Appolonia Consulting Engineer's Engineering and Design Manual Coal Refuse Disposal Facilities, page 6.201;

$$Q_o = 0.20$$

$$Q_p$$

$$Q_{out} = (286 \text{ cfs})(0.20)$$

$$Q_{out} = 57 \text{ cfs}$$

From the headwater to diameter charts on the following page, (2) 30 inch culverts are adequate for the primary outlet.

No emergency spillway is proposed. The pond design meets the 25 yr. storm requirements.

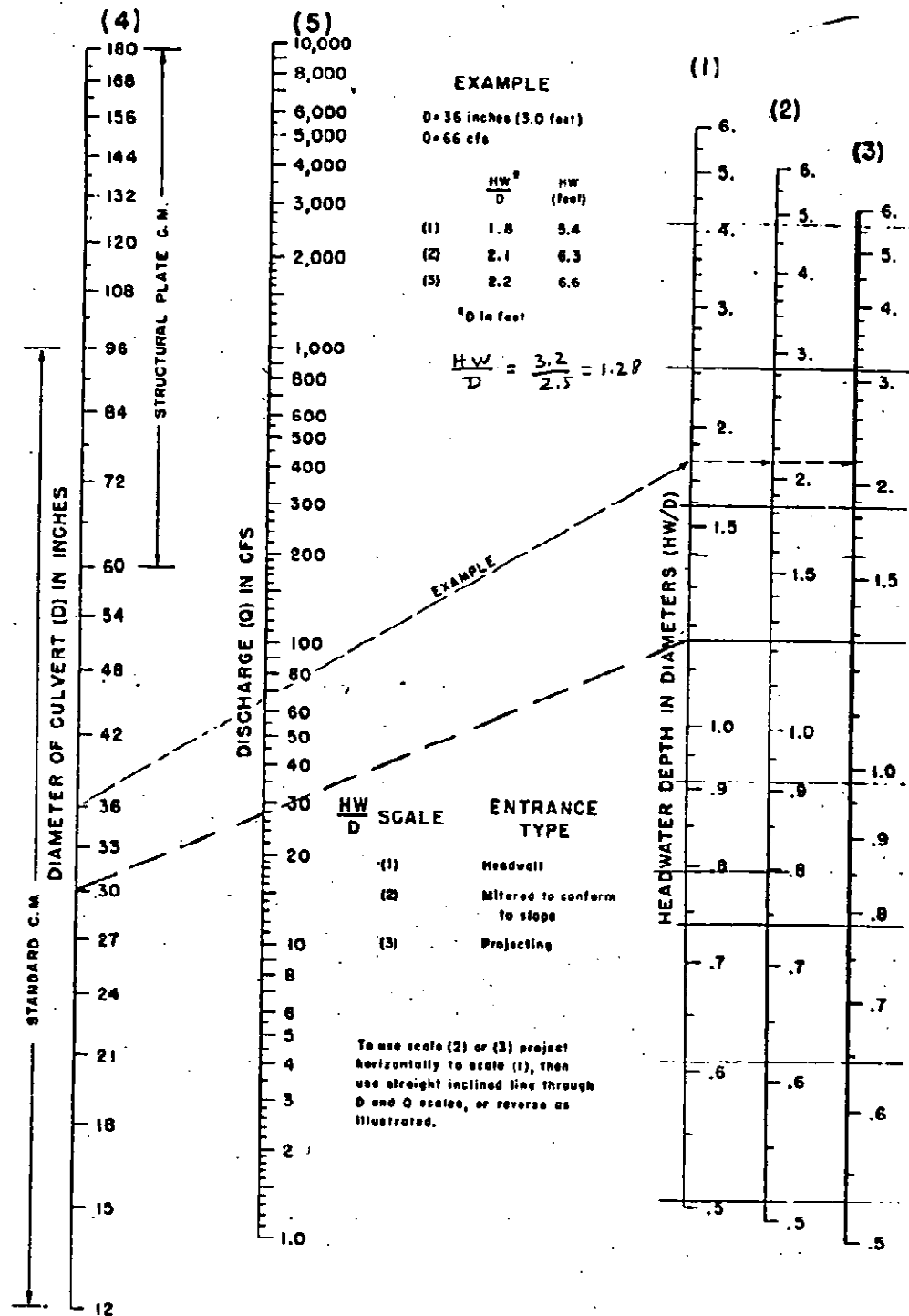


Exhibit 3-10 Headwater depth for CM pipe culverts with inlet control (Ref. Hyd. Eng. Cir. No. 5, USBPR, 1965)

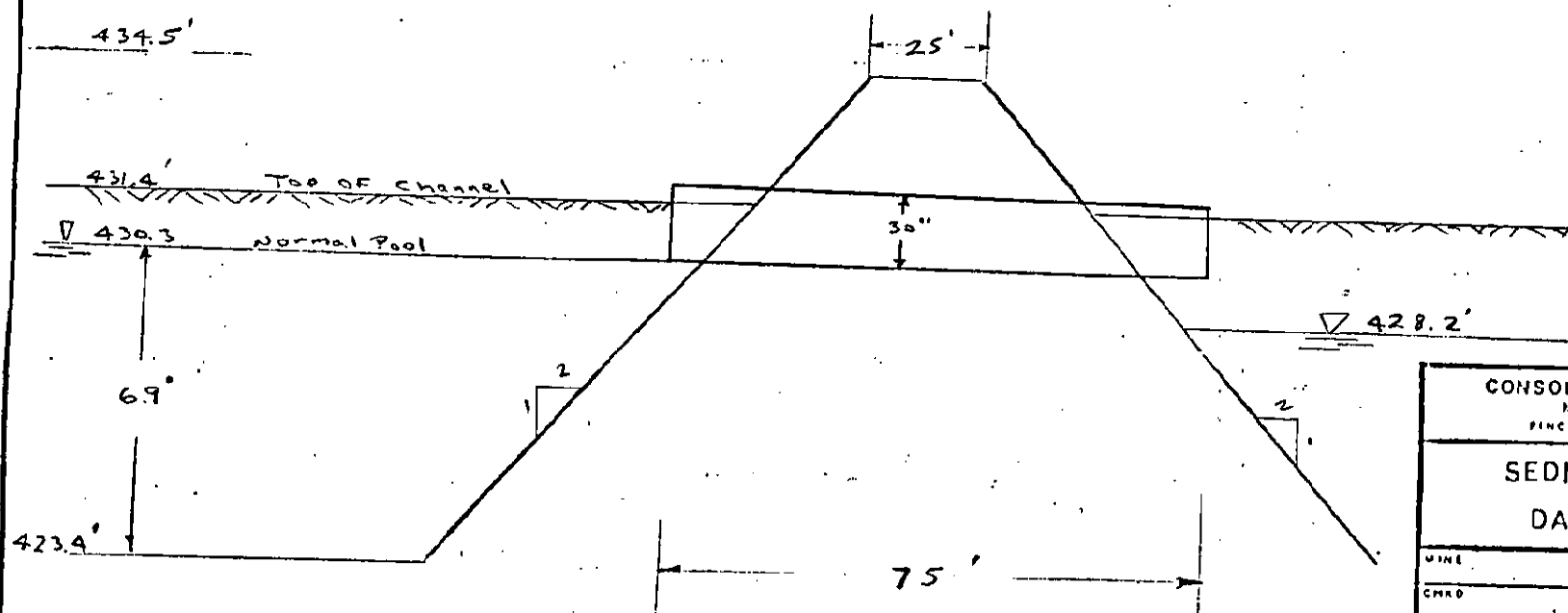
# HYDROLOGIC DATA

Design storm 10 yr / 24 hr  
 Precipitation amount 4.9 (in)  
 Drainage area 456.8 (acres)  
 Hydrologic soil group A

Curve number 75  
 Pit pumpage 0 (gpm)  
 Runoff volume 27.6 (ac-ft)

# IMPOUNDMENT DATA

Sediment volume 16.0 (ac-ft)  
 Surface area at normal pool 18.0 (ac)  
 Volume at normal pool 55 (ac-ft)  
 Maximum depth at normal pool 6.9 (ft)



CONSOLIDATION COAL COMPANY  
 MIDWESTERN DIVISION  
 PINCKNEYVILLE, ILLINOIS 62274

SEDIMENT POND DATA  
 DAM I.D. NO. PMB

DATE	DATE
SCALE	SCALE
DRAWING NO.	REV.
SHEET OF	



## SEDIMENT POND BS 4-9 (PMC)

### Southern Section

#### I. Design Information

Storm Event:	10 yr./24 hr.
Precipitation	4.9 inches
Drainage Area:	267 Acres + Discharge from (PMB)
Hydrologic Group:	A
Runoff Curve No.:	75

#### II. Design Volumes

Storm Runoff Volume:

$$(267 \text{ ac}) (0.083 \text{ ac-ft/ac}) = 22.2 \text{ ac-ft}$$

Sediment Storage Volume:

$$(267 \text{ ac}) (0.035 \text{ ac-ft/ac}) = \underline{9.3 \text{ ac-ft}}$$

$$\text{Total Design Storage Volume} = 31.5 \text{ ac-ft}$$

Minimum Design Surface Area:

$$\begin{aligned} (267 \text{ ac}) (448 \text{ ft}^2/\text{ac}) &= 119,616 \text{ ft}^2 \\ &= 2.70 \text{ acres} \end{aligned}$$

#### III. Pond Sizing

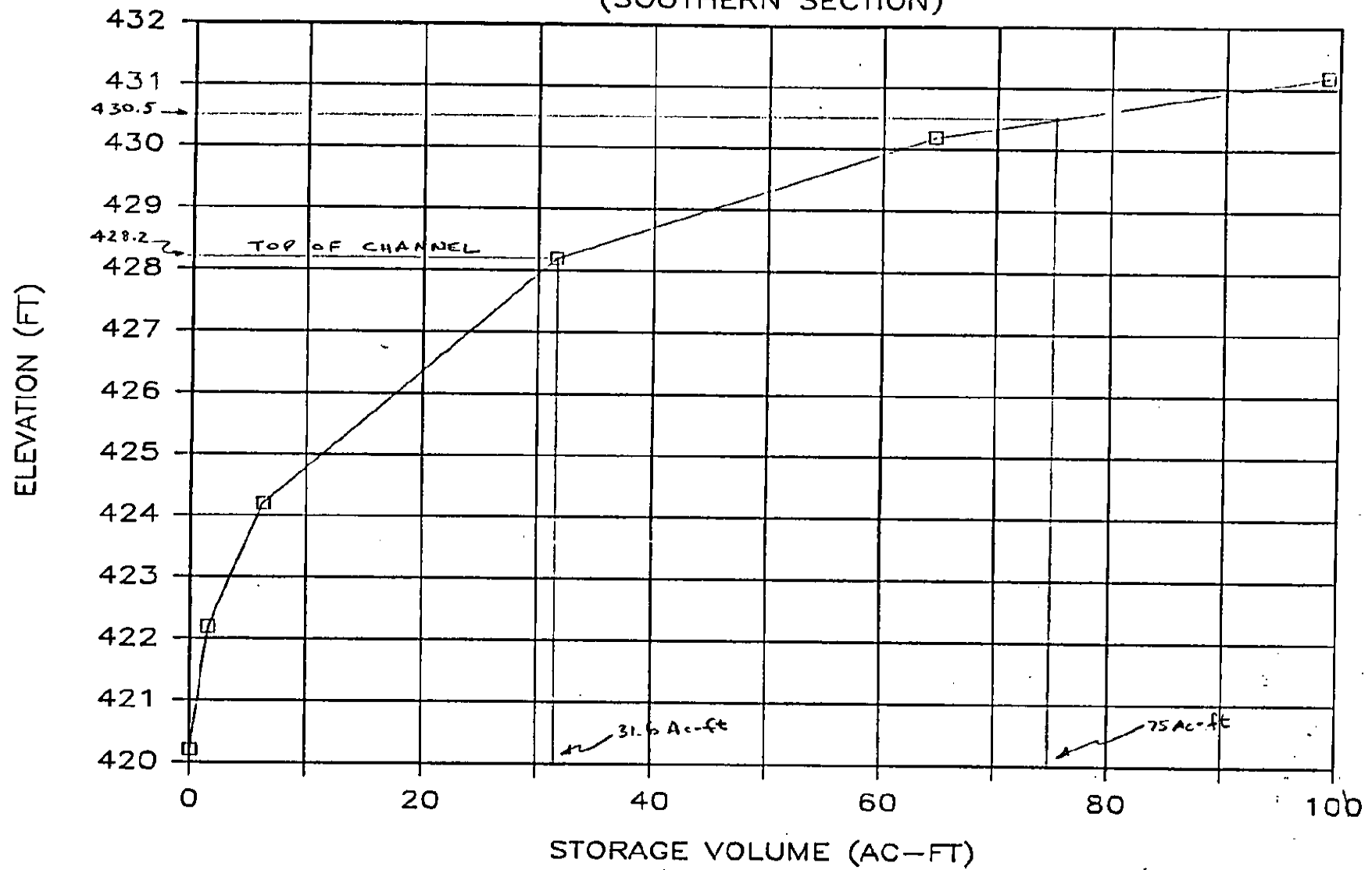
From elevation versus storage volume graph (following page), the storage volume within the channel at a water depth of 8 feet will be 31.6 acre-feet (31.5 ac-ft will be needed to meet design volume).

$$\text{Normal Pool Elevation} = 428.2$$

Surface Area:

$$\text{Approximate surface area of pond is } 16.4 \text{ acres ( } 3.0 \text{ acres).}$$

# STORAGE VOLUME VS. ELEVATION (SOUTHERN SECTION)



#### IV. Spillway Sizing

CN = 75  
Slopes = Flat  
Precipitations = 4.9 inches  
Drainage Area = 267 acres

##### A. 10 Yr./24 Hr. Storm

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4, Hydrology, Chapter 10, page 10.21;

Therefore, total runoff volume is

$$V_t = \frac{(267 \text{ acres})(2.3 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 51.2 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ )

From SCS Engineering Field Manual, Chapter 2, Page 2-59, Exhibit 2-10;

$$Q_p = 160 \text{ cfs}$$

##### B. 25 YR./24 Hr. Storm

Precipitation - 5.6 inches

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4, Hydrology, Chapter 10, Page 10.21;

Direct runoff from 5.6 inches rainfall is 3.0 inches.

$$V_t = \frac{(267 \text{ acres})(3.0 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 66.8 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ );

From SCS Engineering Field Manual, Chapter 2, Page 2-65, Exhibit 2-10;

$$Q_p = 200 \text{ cfs} + 57 \text{ cfs (discharge from PMB)} \\ + \frac{50 \text{ cfs (from #74)}}{307 \text{ cfs}}$$



۹

The haulroad culverts were designed to handle design  $Q_p$  into pond (PMC). The headwater to depth chart shows that (3) 5' culverts should be sufficient.

$$Q_p \text{ (PMC)} = 307 \text{ cfs}$$

From headwater to diameter chart

$$\frac{H_w}{D} = \frac{5'}{5'} = 1 \quad \text{one 5' culvert with 5' head} = 110 \text{ cfs}$$

$$\begin{array}{r} 110 \text{ cfs} \\ 3 \\ \hline 330 \text{ cfs} \end{array} \quad 307 \text{ cfs}$$

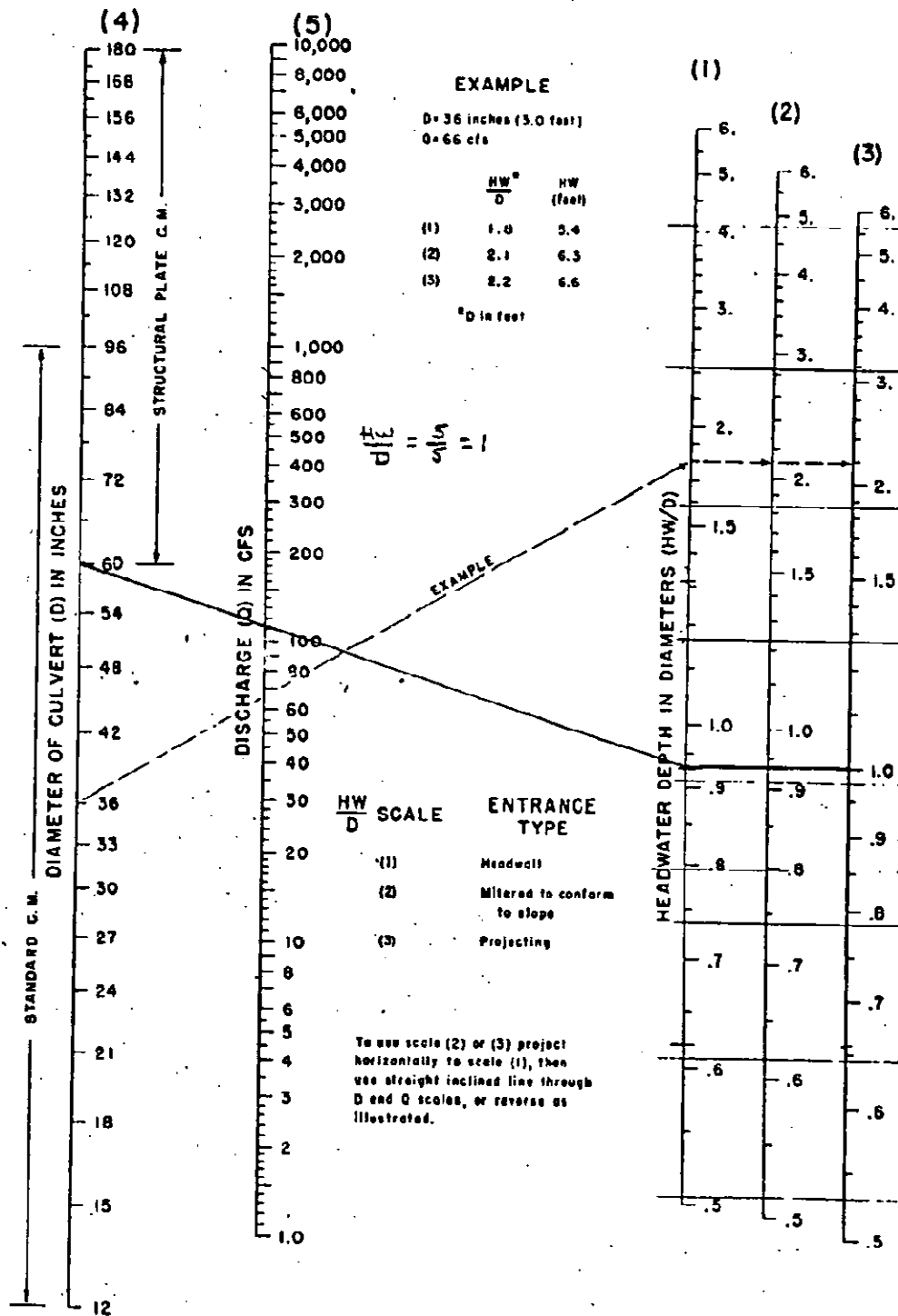
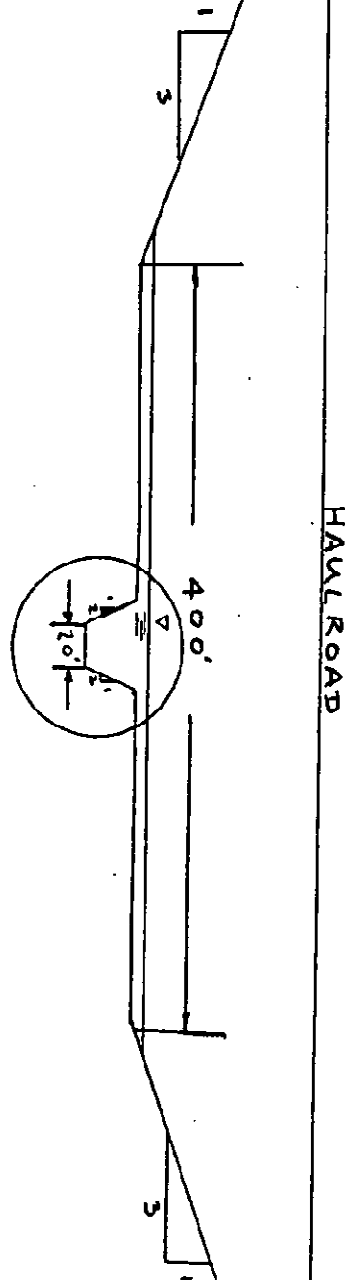
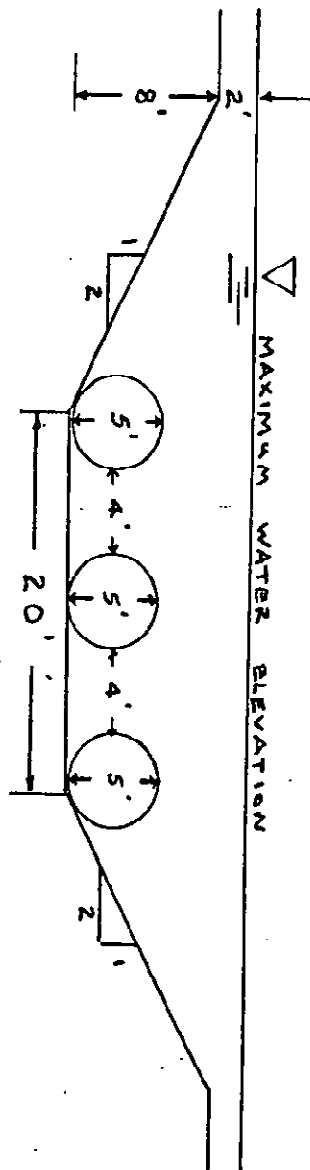


Exhibit 3-10 Headwater depth for CM pipe culverts with inlet control (Ref. Hyd. Eng. Cir. No. 5, USBPR, 1965)



**CONSOLIDATION  
COAL CO.**

TITLE

Haulroad Culverts

DRAWN BY

CHK'D BY

DRAWING NO.



Agency ID: 170001458367

Media File Type WATER

Bureau ID: W1458990016

Site Name: Consolidation Coal burning Star4

Site Address1: 2.5 Miles NE Of

Site Address2:

Site City: Cutler

State: IL

Zip: 62274-

**This record has been determined to  
be partially or wholly exempt from  
public disclosure**

**Exemption Type:**

**Portion Removed**

**Exempt Doc #: 10**

**Document Date: 7 /19/2010**

**Staff: JKS**

**Document Description:** PERMIT APPLICATION -MODIFICATIONS AND SUPPORTING  
INFORMATION: LARGE SCALE MAPS (DATED: 04/17/1986)(VOLUME #11)

**Category ID: 16**

**Category Description:** NPDES PERMITS/BACKUP

**Exempt Type:** Portion Removed

**Permit ID:** IL0052795

**Date of Determination:** 11/12/2015





217/785-0748

Consolidation Coal Co. - Burning Star No. 4 (Perry County) BS 4-9, IL0052795,  
IEPA Log #'s 4018A-C4, 2113 B-86

April 17, 1987

Consolidation Coal Co.  
Attn: Mick Neuman  
12755 Olive Boulevard  
St. Louis, Missouri 63141

Gentlemen:

Enclosed please find a copy of the proposed construction authorization which has been drafted for inclusion in your NPDES Permit for the subject facilities. As this proposed construction authorization will be contained in the proposed NPDES Permit, it will be distributed for comment according to the NPDES Public Notice procedures. Any questions or comments regarding the contents and/or conditions of this proposed construction authorization should be made during the comment period allowed under the NPDES Public Notice procedures.

Sincerely,

Edwin C. Bahowski, P.E.  
Manager, Permit Section  
Mine Pollution Control Program

ECB:jfd/2057g/37

Enclosure

cc: Field Office  
Department of Mines and Minerals

NOI CORRELATION OF RECORDS MANAGEMENT  
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NOV 12 2015

REVIEWER: JKS

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APR 20 1987

IL ENVIRONMENTAL PROTECTION AGENCY  
MARION REGIONAL OFFICE

6/11/87  
WB

Auth. No.: 4018-84, 2113-86, 2059-86

IL0052795

Appl. No.: 4018F-84, 2113B-86

C.A. Date: April 17, 1967

Nicolaus Neuman, P.E.

Consolidation Coal Co. NS4-1

**AUTHORIZATION TO CONSTRUCT TO:**

Consolidation Coal Co.

Attn: Nick Neuman

12755 Olive Boulevard

St. Louis, Missouri 63141

Supplemental Authorization is hereby granted to the above designee to construct and mine refuse area, which were previously approved under Authorization No. 2059J-86 dated January 6, 1967. These facilities have been revised as follows:

The approval of experimental plans to reclaim a slurry disposal area consisting of 72 acres within the current permit area as described in Application IEPA Log 4018A-84.

The abandonment plan in accordance with 35 Ill. Adm. Codes 405.106 and 405.107 are contained in the referenced application.

Also included are drainage control modifications and designs for ponds with outfall numbers 025, 025B, 033A and 033B. Of these, only 025, as designed, qualifies for the exemption of 405.106(b)(3) and it is subject to special condition #1. Ponds 025B, 033A and 033B all are tributary to Gallum Creek. Pursuant to 35 Ill. Admin. Code 405.202 the water quality standards of 35 Ill. Admin. Code 405.202 as they apply to sulfates, chlorides, total dissolved solids, iron and manganese shall not apply to discharges 025B, 033A and 033B subject to Special Condition #2.

All conditions in the original Authorization to Construct are incorporated in this Supplemental Authorization unless specifically deleted or revised herein.

This Supplemental Authorization is issued subject to the following condition(s). If such condition(s) require(s) additional or revised facilities, appropriate engineering plan documents must be submitted to this Agency for review and approval to secure issuance of a Supplemental Authorization to Construct.

1. To remain eligible for the exemption, no pumping may occur during precipitation and the intake structure shall be positioned to not allow scouring of sediment.
2. Any of the following shall be a violation of the provisions required under 25 Ill. Admin. Code 406.203(c):
  - A. It is demonstrated that an adverse effect on the environment in and around the receiving stream has occurred or is likely to occur.
  - B. It is demonstrated that the discharge has adversely affected or is likely to adversely effect any public water supply.
  - C. The Agency determines the permittee is not utilizing good mining practices which are applicable in order to minimize the discharge of total dissolved solids, chloride, sulfate, iron and manganese. The following concentrations are presumed achievable according to information in the application, and demonstrate the utilization of good mining practices. The Agency may require additional information to determine compliance with 25 Ill. Admin. Code 406.204 when they are exceeded.

<u>Outfall</u>	<u>Chloride in mg/l</u>	<u>Sulfate in mg/l</u>	<u>Other</u>
025B, 033A, 033B	500	900	

3. Monitoring of pond 008A may terminate upon approval by this Agency in writing.
4. Monthly grab samples shall be taken of the discharges from the experimental area at the decant structure. They shall be analyzed for pH, suspended solids, sulfate, iron, acidity and alkalinity. These reports shall be submitted annually along the fourth quarter DMR's.

ED:jc/20576/38-39

TO: Phil Dawson - DWPL PermitsDATE: 4/17/87FROM: Ed Bakowski - MCLP☒ Information onlySUBJECT: Consolidation Coal Co. - Burning Star No. 4☐ Response requestedIEPA Log # 4018A & 4, 2113B-86

IL 0052795

Attached is a Suppl. C. App. to modify Permit  
(suppl. to renewal.)  
also attached appl. forms.

This C.A. is for experimental refuse disposal  
and drainage mod. to ponds 025, 025B, 033A & 033B.

025 gets rainfall & already has WQ exemption

025B, 033A & 033B do not get rainfall - but do get WQ  
in this C.A.

Sampling, reporting & survey stay the same.

Attachments - CA app. 025.

v-c FOS w/CA

App. - w/out



STATE OF ILLINOIS  
DEPARTMENT OF MINES AND MINERALS  
LAND RECLAMATION DIVISION

RICHARD R. SHOCKLEY  
DIRECTOR

4018-84  
RECEIVED

AUG 6 1987

MINE PERMIT DIVISION

C 1227 SOUTH 7TH ST., 201  
SPRINGFIELD, ILLINOIS 62701  
TELEPHONE: (217) 782-4970

4018-84

MEMORANDUM

TO: Steve Chard, Dept. of Agriculture  
Jay R. Hedges, Dept. of Commerce and Community Affairs  
Patrick Malone, Dept. of Conservation  
Ron Barganz, Environmental Protection Agency  
Edwin Bakowski, Environmental Protection Agency  
David R. Boyce, Dept. of Transportation  
Thomas E. Emerson, Ill. Historic Preservation Agency

FROM: Ernest Ashby, Permit Coordinator  
Land Reclamation Division

DATE: August 5, 1987

Enclosed is the issued permit for Consolidation Coal Company,  
Burning Star #4 Mine, application number 120.

Enclosure

cc: J. Fulton  
A. Meyers  
R. Zinszer  
T. Johnson  
A. Vaughn  
A. Rice  
T. Hickman

EPA DIVISION OF RECORDS MANAGEMENT  
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NOV 12 2015

REVIEWER: JKS

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AUG 10 1987

IL ENVIRONMENTAL PROTECTION AGENCY  
MARION REGIONAL OFFICE

State of Illinois  
Department of Mines and Minerals  
Land Reclamation Division  
Surface Coal Mining Land Conservation and Reclamation Act

**Surface Coal Mining and Reclamation Operations Permit**

**This is to certify that**

Consolidation Coal Company

12755 Olive Boulevard, St. Louis, Missouri 63141

**is hereby granted a permit to engage in mining and reclamation operations**

**from** August 4, 1987 **to** August 4, 1992

**on the legally described areas as stated below:**

Name of Mine	Address	Acres to be Affected	Location			
			Sec.	Twp.	Range	County
Burning Star #4		72	33 & 34	5S	4W	Perry

**Permit No.** 120

**Date** August 4, 1987

SUPERVISOR: [Signature]  
Land Reclamation Division

DIRECTOR: [Signature]

(32351-250 Sets-6/82)

**Terms:**

The permittee is responsible for and shall conduct all surface coal mining and reclamation operations pursuant to this permit in compliance with the Illinois Surface Coal Mining Land Conservation and Reclamation Act and the Regulations of the Department adopted thereunder. The permittee shall conduct its operations as described in its complete application with modifications, and in accordance with the Department's directions and conditions in the findings.

BS-#4



21 1386

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NOV 17 1986

November 5, 1986

ENVIRONMENTAL PROTECTION AGENCY  
MARION REGIONAL OFFICE

Mr. Douglas Downing  
Illinois Department of Mines & Minerals  
Land Reclamation Division  
227 South 7th Street, Room 201  
Springfield, IL 62706

Mr. Ed Bakowski  
Illinois Environmental Protection Agency  
Mining Program  
2200 Churchill Road  
Springfield, IL 62706

Re: Burning Star #4, Permit #'s 118, 74 & 152  
Insignificant Revision

Dear Sirs:

In accordance with Rule 1788.12(a)(1)(iv), we are proposing an insignificant mining operations plan change to the above referenced permits.

We are proposing building two new ponds in Permit #152, one new pond in Permit #'s 118 and 74, and one revised pond in Permit #'s 118 and 74. These changes are necessary due to pit advancement, necessary advance development, and the unavailability of Bonnie Creek channel as a sediment pond.

Ponds (033A) and (033B) are located in Permit #152. Both ponds will receive drainage from Permit #'s 74 and 152. Pond 025 will have an additional 4 ac-ft incised volume to ensure its performance until the Bonnie channel is available. Pond 025B will handle boxcut drainage and drainage off the 1550 parking area. We also request a secondary 900 gpm pump discharge at each of the above referenced outfalls. This pumping would be done only during non-rainfall periods. This operation should enhance each ponds storage characteristics during rainfall periods.

All appropriate design work is enclosed. If there are any questions, please feel free to contact this office.

Sincerely,

*Marc A. Tidquist*

Marc A. Tidquist  
Environmental Engineer

DEPARTMENT OF RECORDS MANAGEMENT  
RELEASEABLE

NOV 12 2015

REVIEWER: JKS

MAT/vls

cc: Alan Meyers

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NOV 07 1986

MINE POLLUTION  
CONTROL PROGRAM

*We should get additional  
copies from IDMA  
upon approval*

*(we did get 2 copies of maps)*





2113-86

217/785-0748

Consolidation Coal Company, Burning Star A-9, Northfield, Perry County, IEPA  
Log #2113-86, IL0052795, Insignificant Risk

January 15, 1987

JAN 27 1987

ENVIRONMENTAL PROTECTION AGENCY  
REGIONAL OFFICE

Consolidation Coal Company  
Attention: Nick Neumann  
12755 Olive Boulevard  
St. Louis, Missouri 63141

Gentlemen:

We received your application for Permit and supporting information concerning the above referenced project on November 7, 1986, dated November 5, 1986. This application has been reviewed by the Permit Section Staff, and based upon that review, the following items are offered for your consideration and appropriate action:

1. The drainage area used to calculate the runoff volume for sediment pond 025 is different than drainage area on the drawing for sediment pond 025. This discrepancy needs to be corrected.
2. The designs for sediment pond 033B gives a volume of 35 ac.-ft. at the primary spillway, which does not exceed the runoff volume of a 10-yr./24-hr. storm event if you allow for sediment storage. Sediment pond BS4-9 (033B) does not qualify, as designed, for the rainfall exemption of 35 Ill. Adm. Code 406.106(b)(3).
3. The sediment pond data for BS4-9 (033A) is not consistent with the designs of 033A on the preceding pages. The runoff volume of 16.6 ac.-ft. appears to be for the 25-yr./24-hr. storm event. Should the hydrologic soil group be "A" or "C"? How did you arrive at the sediment storage volume? A volume, at normal pool, of 13.0 ac.-ft. does not appear to be consistent with a surface area of 1.7 ac. and maximum depth of 3.1 ft. at normal pool. These discrepancies should be eliminated.

The Agency will be pleased to re-evaluate your permit application on receipt of your written request and the necessary information and documentation to correct or clarify the deficiencies noted above. If this application is being used jointly as an application for a Department of Mines and Minerals Mining Permit and an Illinois EPA Mining Permit, we suggest that the above information be submitted through the Department of Mines and Minerals as a modification of the application. If you choose to submit the information directly to the Agency, please submit two (2) copies of the response and refer to the log numbers noted in the above subject heading.

NOVA DIVISION OF RECORDS MANAGEMENT  
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NOV 12 2015

REVIEWER: JKS

GLH  
W8



Page 2

Should you have any questions or concerns regarding the above, or need any additional information concerning Agency requirements, please contact Environmental Protection Engineer Joyce Dunie at the above telephone number and address.

Sincerely,

A handwritten signature in cursive script, appearing to read "Edwin C. Bakowski".

Edwin C. Bakowski, P.E.  
Manager, Permit Section  
Mine Pollution Control Program

ECB:JH:rd1167g/97-98

cc: Regional Office ✓  
Department of Mines and Minerals

2113A-86

CONSOL

Consolidation Coal Company  
Mid-Continent Region  
12755 Olive Boulevard  
St. Louis, Missouri 63141  
(314) 275-2300

January 7, 1987

Mr. Edwin C. Bakowski, P.E.  
Manager, Permit Section  
Mine Pollution Control Program  
Illinois Environmental Protection Agency  
2200 Churchill Road  
Springfield, IL 62706

RECEIVED

JAN 07 1987

MINE POLLUTION  
CONTROL PROGRAM

RE: N.P.D.E.S. Permit Renewal  
N.P.D.E.S. Permit No. IL0052795(BS4-9)  
Burning Star No. 4 Mine - North & Northeast Fields

Dear Mr. Bakowski:

As requested by agency, please change the data in Section 1 (Outfall Location) of "Form 2C NPDES" as submitted on May 29, 1986 to reflect the following:

<u>Outfall No.</u>	<u>Receiving Water</u>
001	Galum Creek
001A	"
005	"
015	Unnamed Tributary of Bonnie Creek
021	Galum Creek
025	"
008A	"
017	"
022	"
032	Unnamed Tributary of Bonnie Creek
032A	"
033	Galum Creek
034	"
035	Bonnie Creek Diversion
036	"
037	"
038	"
039	Galum Creek Diversion

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ENVIRONMENTAL PROTECTION AGENCY  
MARION REGIONAL OFFICE

EPA DIVISION OF RECORDS MANAGEMENT  
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NOV 12 2015

REVIEWER: JKS

The location data previously submitted is still correct.

Should you have any questions or comments, please feel free to contact this office.

Sincerely,



Nicolaus P. Neumann, P.E.  
Group Leader - Permits

NPN:vms

**Consolidation Coal Company**  
 Mid-Continent Region  
 12755 Olive Boulevard  
 St. Louis, Missouri 63141  
 (314) 275-2300

*1 copy rec'd*

January 21, 1987

*ASJ - 1 - 2 copies*

*with copy from IDA*

Mr. Douglas Downing  
 Illinois Department of Mines & Minerals  
 Land Reclamation Division  
 227 South 7th Street, Room 201  
 Springfield, IL 62706

**RECEIVED**

JAN 22 1987

**MINE POLLUTION  
 CONTROL PROGRAM**

Mr. Ed Bakowski  
 Illinois Environmental Protection Agency  
 Mining Program  
 2200 Churchill Road  
 Springfield, IL 62706

Re: Burning Star #4, Permit #'s 118, 74 and 152  
 Insignificant Revision (Dated November 5, 1986)

Dear Sirs:

In response to your request for additional information, please find enclosed an updated copy of the above referenced revision.

If there are any additional questions, please feel free to contact this office.

Sincerely,

*Marc A. Tidquist*

Marc A. Tidquist  
 Environmental Engineer

MAT/vls

Enclosure

cc: Alan Meyers

**RECEIVED**

JAN 23 1987

EPA-DIVISION OF RECORDS MANAGEMENT  
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REVIEWER: JKS


U.S. ENVIRONMENTAL PROTECTION AGENCY  
 MARION REGIONAL OFFICE

*GLM*  
*WBR*

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FEB 10 1987

**MINE POLLUTION  
CONTROL PROGRAM**

2113B-86  
  
**Consolidation Coal Company**  
Mid-Continent Region  
12755 Olive Boulevard  
St. Louis, Missouri 63141  
(314) 275-2300

February 9, 1987

Mr. Douglas Downing  
Illinois Department of Mines & Minerals  
Land Reclamation Division  
227 South 7th Street, Room 201  
Springfield, IL 62706

Mr. Ed Bakowski  
Illinois Environmental Protection Agency  
Mining Program  
2200 Churchill Road  
Springfield, IL 62706

Re: Burning Star #4, Permit #'s 118, 74 and 152  
Insignificant Revision (Dated November 5, 1986)

Dear Sirs:

In response to the EPA request (dated January 15, 1987) for additional information, please find enclosed an updated copy of the above referenced revision.

If there are any additional questions, please feel free to contact this office.

Sincerely,

*Marc A. Tidquist*

Marc A. Tidquist  
Environmental Engineer

MAT/vls

Enclosure

cc: Alan Meyers

EPA DIVISION OF RECORDS MANAGEMENT  
RELEASE

NOV 12 2015

REVIEWED: JKS

RECEIVED

FEB 18 1987

U.S. ENVIRONMENTAL PROTECTION AGENCY  
MARTIN REGIONAL OFFICE



217/785-0748

Consolidation Coal Company, Burning Star 4-9; Northfield, Perry County, IEPA  
Log #2113-86, IL0052795, Insignificant Rev. IDMM #118, 74 & 152

January 15, 1987

Consolidation Coal Company  
Attention: Nick Neumann  
12755 Olive Boulevard  
St. Louis, Missouri 63141

Gentlemen:

We received your application for Permit and supporting information concerning the above referenced project on November 7, 1986, dated November 5, 1986. This application has been reviewed by the Permit Section Staff, and based upon that review, the following items are offered for your consideration and appropriate action:

1. The drainage area used to calculate the runoff volume for sediment pond 025 is different than drainage area on the drawing for sediment pond 025. This discrepancy needs to be corrected.
2. The designs for sediment pond 033B gives a volume of 35 ac.-ft. at the primary spillway, which does not exceed the runoff volume of a 10-yr./24-hr. storm event if you allow for sediment storage. Sediment pond BS4-9 (033B) does not qualify, as designed, for the rainfall exemption of 35 Ill. Adm. Code 406.106(b)(3).
3. The sediment pond data for BS4-9 (033A) is not consistent with the designs of 033A on the preceding pages. The runoff volume of 16.6 ac.-ft. appears to be for the 25-yr./24-hr. storm event. Should the hydrologic soil group be "A" or "C"? How did you arrive at the sediment storage volume? A volume, at normal pool, of 13.0 ac.-ft. does not appear to be consistent with a surface area of 1.7 ac. and maximum depth of 3.1 ft. at normal pool. These discrepancies should be eliminated.

The Agency will be pleased to re-evaluate your permit application on receipt of your written request and the necessary information and documentation to correct or clarify the deficiencies noted above. If this application is being used jointly as an application for a Department of Mines and Minerals Mining Permit and an Illinois EPA Mining Permit, we suggest that the above information be submitted through the Department of Mines and Minerals as a modification of the application. If you choose to submit the information directly to the Agency, please submit two (2) copies of the response and refer to the log numbers noted in the above subject heading.



Page 2

Should you have any questions or comments regarding the above, or need any additional information concerning Agency requirements, please contact Environmental Protection Engineer Joyce Munie at the above telephone number and address.

Sincerely,

A handwritten signature in cursive script, reading "Edwin C. Bakowski".

Edwin C. Bakowski, P.E.  
Manager, Permit Section  
Mine Pollution Control Program

ECB:JM:rd1167g/97-98

cc: Regional Office  
Department of Mines and Minerals

BS4-9(025)

Total Drainage Area - 49.8 ac (19.2 Ac. from Ditch A-4)

Soil Group - C

I. Storm Event - 10 yr/24 hr - 4.9"

From Design of Small Dams, United States Department of the Interior, Bureau of Reclamation, Fig. A-4, pg. 541. For a CN of 80 and rainfall of 4.9" the direct runoff in inches is 2.81 inches.

Runoff Volume

$$49.8 \text{ ac} (2.81 \text{ inches}) \frac{\text{foot}}{12 \text{ inches}} = 11.7 \text{ Ac-Ft}$$

Sediment Storage Volume

$$(0.0011 \text{ Ac-Ft/Ac})(49.8 \text{ Ac})(1 \text{ yr}) \frac{(5000 \text{ mg/l})}{1000 \text{ mg/l}} +$$

$$(0.0013 \frac{\text{Ac-Ft}}{\text{Shift}}) \left( \frac{900 \text{ gpm}}{1000 \text{ gpm}} \right) \left( \frac{2000 \text{ mg/l}}{1000 \text{ mg/l}} \right) \left( \frac{1 \text{ shift}}{\text{day}} \right) \left( \frac{2 \text{ days}}{\text{wk}} \right) \left( \frac{52 \text{ wks}}{\text{yr}} \right) (1 \text{ yr})$$

$$= 0.27 + .24$$
$$= 0.51 \text{ Ac-Ft}$$

With the addition of pit pumpage

$$900 \text{ gal/min} \left( 60 \frac{\text{min}}{\text{hr}} \right) \left( \frac{24 \text{ hrs}}{\text{day}} \right) = 1,296,000 \text{ gals}$$

$$\left( 900 \frac{\text{gal}}{\text{min}} \right) \left( \frac{\text{min}}{60 \text{ sec}} \right) \left( .13368 \frac{\text{ft}^3}{\text{gal}} \right) = 2 \text{ cfs}$$

$$1,296,000 \text{ gal} \left( .13368 \frac{\text{ft}^3}{\text{gal}} \right) \left( \frac{\text{ac}}{43560 \text{ ft}^2} \right) = 3.98 \text{ ac-ft}$$

$$\begin{array}{r} \text{Total 10 yr/24 hr inflow volume is } 11.7 \text{ Ac-Ft} \\ 0.5 \text{ Ac-Ft} \\ + 4.0 \text{ Ac-Ft} \\ \hline 16.2 \text{ Ac-Ft} \end{array}$$



Volume Available at Normal Pool (Pond 025):

Top Width 40'  
Bottom Width 20'  
Depth 8.2'  
Length 1=2400'

Channel

$$\frac{(20 + 40)}{2} 8.2 (2400) = \frac{590,400 \text{ ft}^3}{43560 \frac{\text{ft}^2}{\text{ac}}} = 13.6 \text{ Ac-Ft}$$

An incised pond will be dug contiguous to the channel to provide an additional 4.0 ac-ft storage volume.

#### Incised Pond

Using 8 foot pool depth with 1 foot freeboard

Pond length = 250'

Surface area becomes:

$$4.0 \frac{\text{ac-ft}}{8 \text{ ft}} = 0.5 \text{ acres}$$

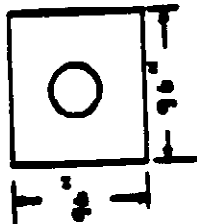
$$\text{Average width} = \frac{0.5 \times 43560}{250} = 87'$$

The service road levee will be elevated at least eight feet above ground level. Thus any additional runoff not fully contained within the pond will be fully contained within the levee until discharged. Thus the pond contained behind the levee contains adequate flood storage capacity to hold any 10 yr/24 hr storm and should qualify for EPA 406.106 exemption.

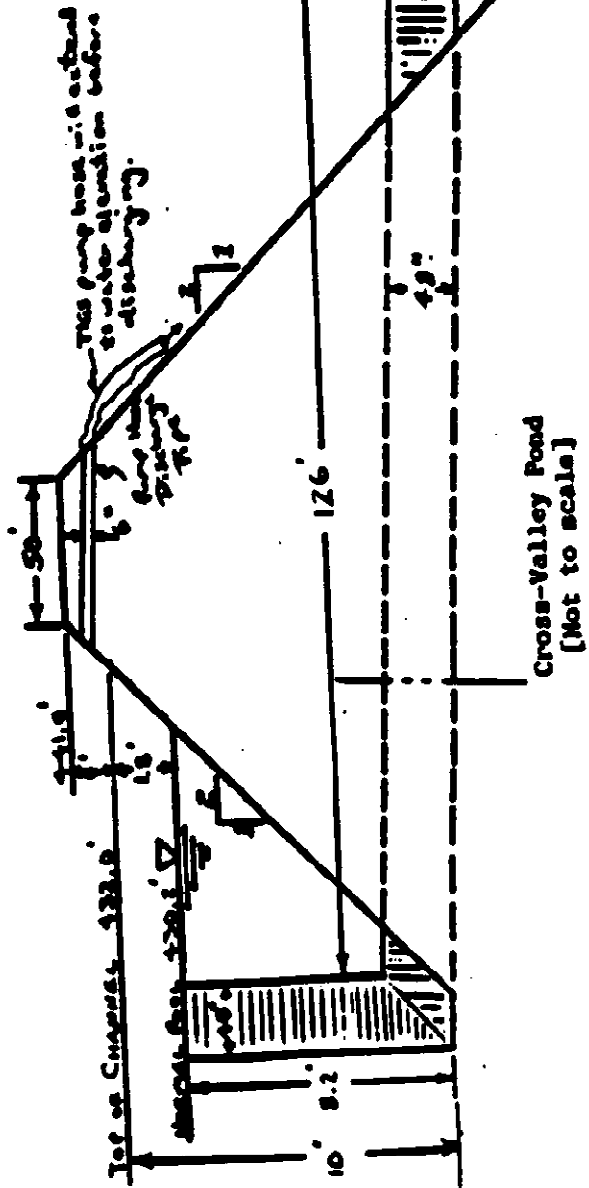
This revision is needed due to advancement of the pit. Pond 025 is being shortened each pass. The incised volume should ensure this ponds performance until the levee is mined through. The original outlet of a 48" decant structure and pump (during periods effluent is acceptable) will continue to be utilized for this system.

# HYDROLOGIC DATA

Design storm 10 YR - 24 WS  
 Precipitation amount 4.9 (in)  
 Drainage area 49.8 (acres)  
 Hydrologic soil group C  
 Curve number 30  
 Pit pumpage 900 (gpm)  
 Runoff volume 11.7 (ac-ft)

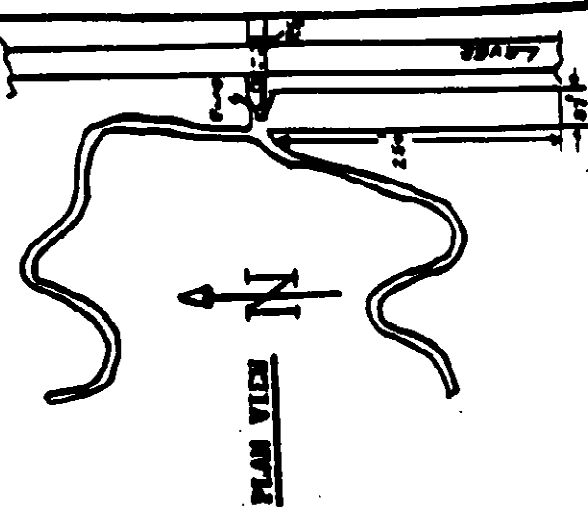


1 cup Anti-Swag Collar



# IMPOUNDMENT DATA

Sediment volume 0.5 (ac-ft)  
 Surface area at normal pool 1.7 (ac)  
 Volume at normal pool 17.6 (ac-ft)  
 Minimum depth at normal pool 3.2 (ft)



CONSOLIDATION COAL COMPANY MINE SYSTEM DIVISION P.O. BOX 100, ALLENDALE, OK 73001	
SEDIMENT POND DATA	
DAM I.D. NO. 25-3-1(025)	
DATE 8.5.4	DATE 10/86
BY B.S. 4	BY 12/11
CHKD 2/76	REVISION NO.
DATE 11.1.7	DATE 11/86

# POND BS4-9(0258)

## Design Information:

Drainage Area = 41.3 Acres  
 Storm Event = 10 yr/24 hr  
 Precipitation = 4.90 inches  
 CN = 80  
 Pit Pumpage = 600 gpm

## I. Sediment Storage Volume (From Sediment Design Storage Volumes)

Estimated maximum suspended solids concentration  
 of inflow = 5000 mg/l\*

Estimated maximum suspended solids concentration  
 of pumpage = 2000 mg/l\*

Sediment volume required for 1 year life of pond (assuming  
 100% trapping efficiency):

$V_s = \text{Runoff suspended solids volume} + \text{pumpage suspended solids volume}$

$$V_s = (.0011 \text{ Ac-Ft/Ac})(41.3 \text{ Ac})(1 \text{ yr}) \left( \frac{5000 \text{ mg/l}}{1000 \text{ mg/l}} \right) +$$

$$(.0013 \text{ Ac-Ft}) \left( \frac{600 \text{ gpm}}{1000 \text{ gpm}} \right) \left( \frac{2000 \text{ mg/l}}{1000 \text{ mg/l}} \right) \left( \frac{1 \text{ shift}}{\text{day}} \right) \left( \frac{2 \text{ days}}{\text{wk}} \right) \left( \frac{52 \text{ wks}}{\text{yr}} \right) (1 \text{ yr})$$

$$V_s = 0.23 \text{ Ac-Ft} + 0.16 \text{ Ac-Ft}$$

$$V_s = 0.38 \text{ Ac-Ft}$$

## II. Pond Design Volume

Total inflow runoff volume ( $V_t$ ), with 2.80 inches of direct runoff  
 from 4.90 inches of precipitation.

$V_t = \text{Runoff volume} + \text{pumpage volume}$

$$V_t = \frac{(2.80 \text{ inches})(41.3)}{12 \text{ inches/ft}} + \frac{(600 \text{ gpm})(60 \text{ min/hr})(24 \text{ hrs})}{(7.48 \text{ gal/ft}^3)(43,560 \text{ ft}^3/\text{ac-ft})}$$

$$V_t = 9.6 \text{ Ac-Ft} + 2.6 \text{ Ac-Ft}$$

$$V_t = 12.2 \text{ Ac-Ft}$$

\* Should far exceed average suspended solids inflow concentrations.

Total design volume of pond:

$$V = \text{Sediment volume} + \text{runoff volume}$$

$$V = 0.4 \text{ Ac-Ft} + 12.2 \text{ Ac-Ft}$$

$$V = \underline{12.6 \text{ Ac-Ft}}$$

### III. Pond Sizing

Incised pond using 10' pool length with 1' freeboard, pond length = 750'. Surface area becomes:

$$\frac{14.3 \text{ Ac-Ft}}{10 \text{ Ft}} = 1.43 \text{ Acres}$$

$$\text{Average width} = \frac{1.43 \times 43560}{750} = 83'$$

### IV. Spillway Sizing

#### A. 10 yr/24 hour Storm Volumes and Flow Rates

##### 1. Total Runoff Volume (Vt):

$$Vt = 12.2 \text{ Ac-Ft, (from earlier calculations)}$$

##### 2. Peak Runoff Rate (Qp) is:

$$Qp = 62 \text{ cfs (from SCS Engineering Field Manual, page 2-59)}$$

#### B. 25 yr/24 hour Storm Volumes and Flow Rates

##### 1. Total Runoff Volume (Vt), with direct runoff of 3.40 inches from 5.60 inches of precipitation.

$$Vt = \frac{(3.40 \text{ inches})(41.3 \text{ Ac})}{12 \text{ inches/ft}} + 2.6 \text{ Ac-Ft (pit pumpage)}$$

$$Vt = 14.3 \text{ Ac-Ft}$$

##### 2. Peak/Runoff Rate Qp, is:

$$Qp = 75 \text{ cfs (from SCS Engineering Field Manual, page 2-59)}$$

C. Outlet Capacity (25 yr/24 hr storm)

The service road levee will be elevated at least eight feet above ground level. Thus any additional runoff not fully contained within the pond will be fully contained within the levee until discharged. Thus the pond contained behind the levee contains adequate flood storage capacity to hold any 10 yr/24 hr storm and should qualify for EPA 406.106 exemption.

A 36" drop structure is proposed as the primary discharge structure, no emergency spillway is proposed. This structure should provide more than adequate discharge capacity for this pond.

### HYDROLOGIC DATA

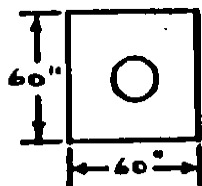
Design storm 10 YR-24 HR  
 Precipitation amount 4.9 (in)  
 Drainage area 41.3 (acres)  
 Hydrologic soil group C  
 Curve number 80  
 Pit pumpage 600 (gpm)  
 Runoff volume 12.2 (ac-ft)

### IMPOUNDMENT DATA

Sediment volume 0.4 (ac-ft)  
 Surface area at normal pool 1.43 (ac)  
 Volume at normal pool 14.3 (ac-ft)  
 Maximum depth at normal pool 10 (ft)

### ANTI-SEEP COLLARS

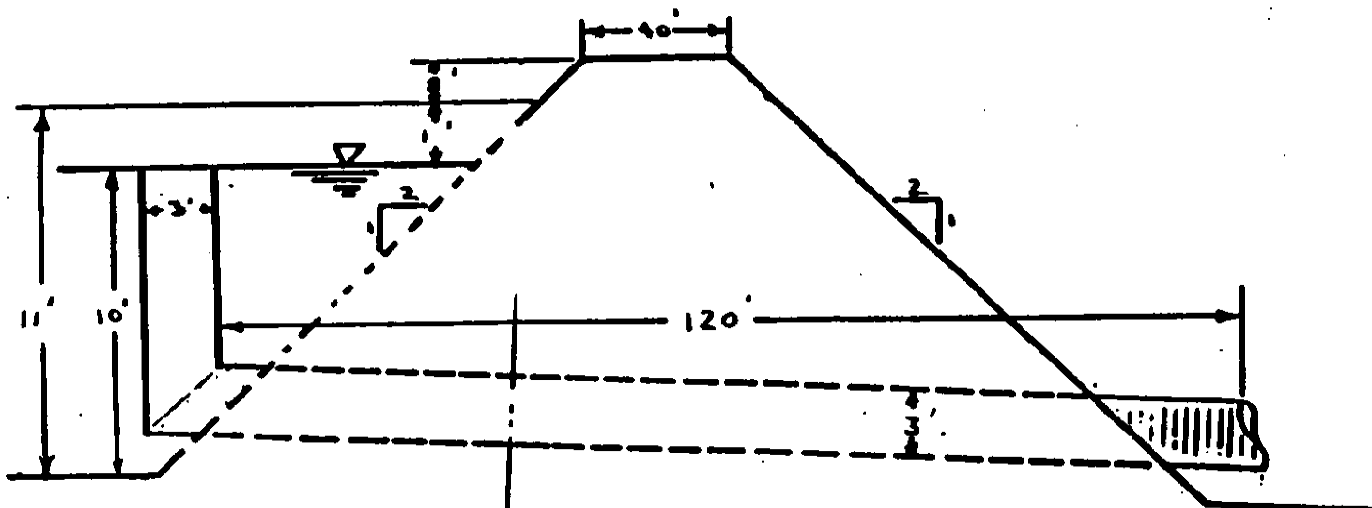
☒ YES (if yes, locate below)



Type: CMF  
 No. used: 1

### PLAN VIEW

See 1" = 400' Map



Cross-Valley Pond  
 [Not to scale]

CONSOLIDATION COAL COMPANY  
 MIDWESTERN DIVISION  
 PINECRESTVILLE, ILLINOIS 62270

SEDIMENT POND DATA  
 DAM ID NO. 0258

DATE	BS #4	DATE	11/86
CASE		SCALE	
APPRO		DRAWING NO.	REV.
DRAWN	HAT	SHEET	OF

## SEDIMENT POND BS 4-9(033A)

### I. Design Information

Storm Event: 10 yr./24 hr.  
Precipitation: 4.9 inches  
Drainage Area: 46.5 Acres + 19.9 ac  
(Pit Pumpage Conversion)  
Hydrologic Group: C  
Runoff Curve No.: 75  
Pit Pumpage: 900 gpm

### II. Design Volumes

Conversion of Pit Pumpages:

$$(900 \text{ gpm}) / (45.2 \text{ gpm/ac}) = 19.9 \text{ ac}$$

Storm Runoff Volume:

$$(46.5 \text{ ac} + 19.9 \text{ ac})(0.083 \text{ ac-ft/ac}) = 5.5 \text{ ac-ft}$$

Sediment Storage Volume:

$$(46.5 \text{ ac} + 19.9 \text{ ac})(0.035 \text{ ac-ft/ac}) = \underline{2.3 \text{ ac-ft}}$$

$$\text{Total Design Storage Volume} = 7.8 \text{ ac-ft}$$

Minimum Design Surface Area:

$$\begin{aligned} (66.4 \text{ ac})(448 \text{ ft}^2/\text{ac}) &= 29,747 \text{ ft}^2 \\ &= 0.7 \text{ acres} \end{aligned}$$

### III. Pond Sizing

From elevation versus storage volume graph (following page), a cross valley impoundment with a depth of 3.1 feet would have a storage volume of 13 acre-feet (7.8 ac-ft needed to meet design volume). Since the pond's volume of 13 acre-feet exceeds the total runoff volume of 12.7 acre-feet, we request this outfall be considered for the rainfall exemption 406.106 of Subtitle D, Chapter 1, Pollution Control Board Regulations.

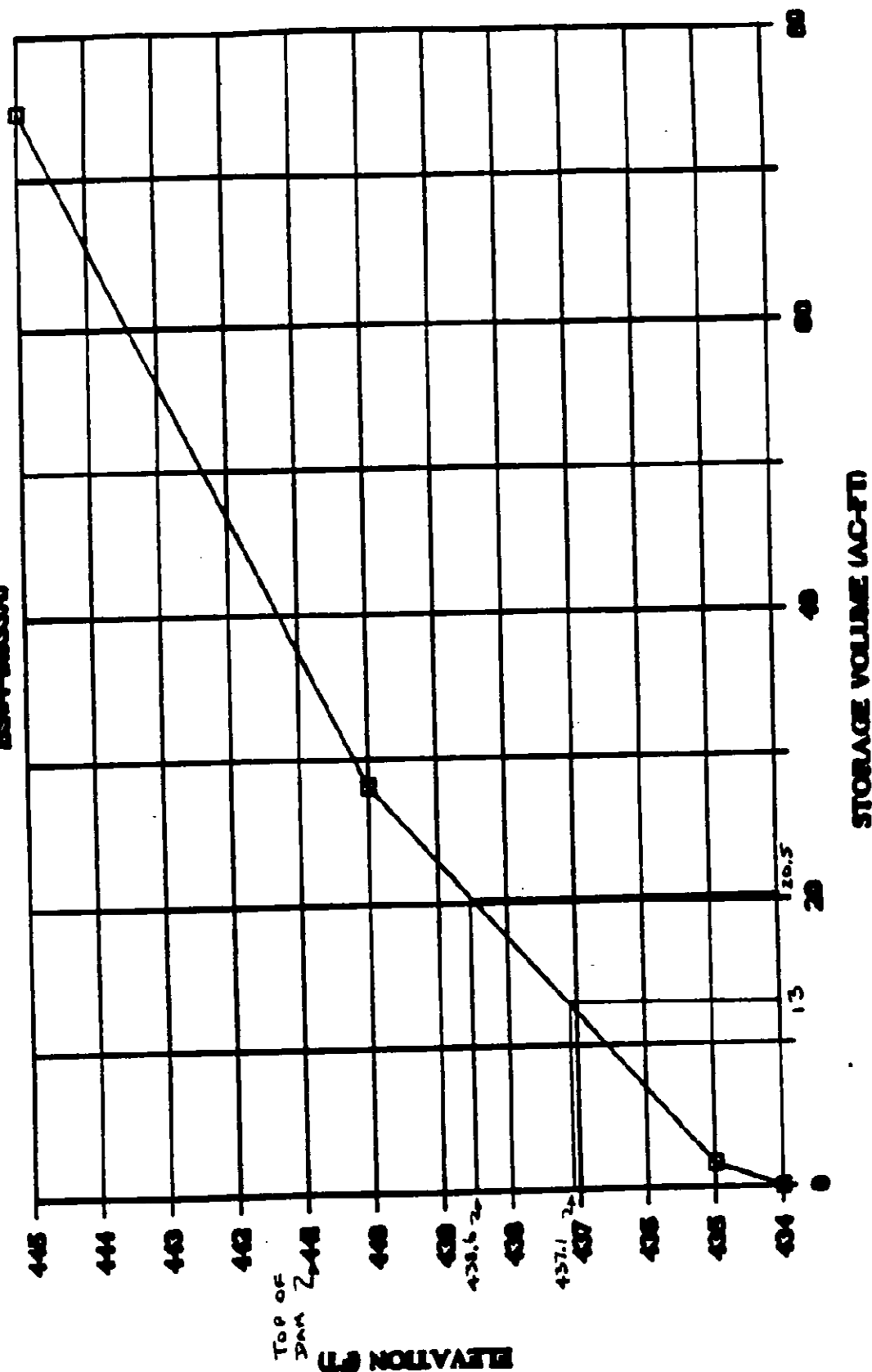
$$\text{Normal pool Elevation} = 437.1$$

Surface Area:

$$\text{Approximate surface area of pond is } 5.0 \text{ acres ( } 0.7 \text{ acres).}$$

# STORAGE VOLUME VS. ELEVATION

2504-0033A





#### IV. Spillway Sizing

CN = 75  
Slopes = Moderate  
Precipitation = 4.9 inches  
Drainage Area = 66.4 acres

##### A. 10 yr./24 hr. storm

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, page 10.21;

Direct runoff from 4.9 inches rainfall is 2.3 inches.

Therefore, total runoff volume is:

$$V_t = \frac{(66.4 \text{ acres})(2.3 \text{ inches})}{12 \text{ inches/ft.}}$$

$$V_t = 12.7 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ )

From SCS Engineering Field Manual, Chapter 2, Page  
2-65, Exhibit 2-10;

$$Q_p = 105 \text{ cfs}$$

##### B. 25 yr./24 hr. storm

Precipitation = 5.6 inches

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, page 10.21;

Direct runoff from a 5.6 inch rainfall is 3.0 inches.

$$V_t = \frac{(66.4 \text{ acres})(3.0 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 16.6 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ );

From SCS Engineering Field Manual, Chapter 2, Page  
2-65, Exhibit 2-10;

$$Q_p = 130 \text{ cfs}$$

C. Outlet Capacity (25 yr/24 hr storm)

Since this pond is created behind a service road levee, no emergency spillway is proposed. The primary spillway, as designed below, is sized to handle a 25 year/24 hour storm.

Set the design maximum pool at an elevation of 438.6 feet, thus, allowing 1.5 feet of volume storage. Available volume storage is:

	<u>Volume</u>
Maximum pool elevation 438.6 ft	20.5 Ac-Ft
Normal pool elevation 437.1 ft	<u>13.0 Ac-Ft</u>
Available storage (Vs)	7.5 Ac-Ft

The volume stored vs total runoff volume ratio during a 10 yr/24 hr design storm is:

$$\frac{V_s}{V_T} = \frac{7.5 \text{ Ac-Ft}}{16.6 \text{ Ac-Ft}} = 0.45$$

The outflow versus inflow ratio from the Preliminary Hydraulic System Sizing Curve, Engineering and Design Manual Coal Refuse Disposal Facilities, page 6.201:

$$\frac{Q_o}{Q_p} = 0.43$$

$$Q_{out} = (0.43)(130 \text{ cfs})$$

$$Q_{out} = 56.0 \text{ cfs}$$

#### D. Outlet Sizing

With 1.5 foot a head, a drop inlet structure can be assumed to be under orifice flow conditions.

$$Q = C' a \sqrt{2gH} \quad \text{When } C' = 0.6$$

$$56 \text{ cfs} = 0.6 (a) \sqrt{2(32.2)1.5}$$

$$56 \text{ cfs} = 5.90(a)$$

$$a = 9.50 \text{ ft}^2 \text{ (required area of pipe for flow of 41 cfs)}$$

Cross sectional area of pipe:

$$a = \frac{\pi D^2}{4} \quad D = \text{pipe diameter}$$

$$9.50 = \frac{3.14 (D^2)}{4}$$

$$D^2 = 12.10 \text{ ft}^2$$

$$D = 3.5 \text{ feet}$$

Use pipe diameter of 3.5 feet.

### HYDROLOGIC DATA

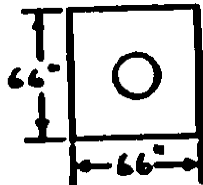
Design storm 10 yr - 24 hr  
 Precipitation amount 4.9 (in) Curve number 75  
 Drainage area 46.5 (acres) Pit pumpage 100 (gpm)  
 Hydrologic soil group C Runoff volume 12.7 (ac-ft)

### IMPOUNDMENT DATA

Sediment volume 2.3 (ac-ft)  
 Surface area at normal pool 5.0 (ac)  
 Volume at normal pool 13.0 (ac-ft)  
 Maximum depth at normal pool 3.1 (ft)

### ANTI-SEEP COLLARS

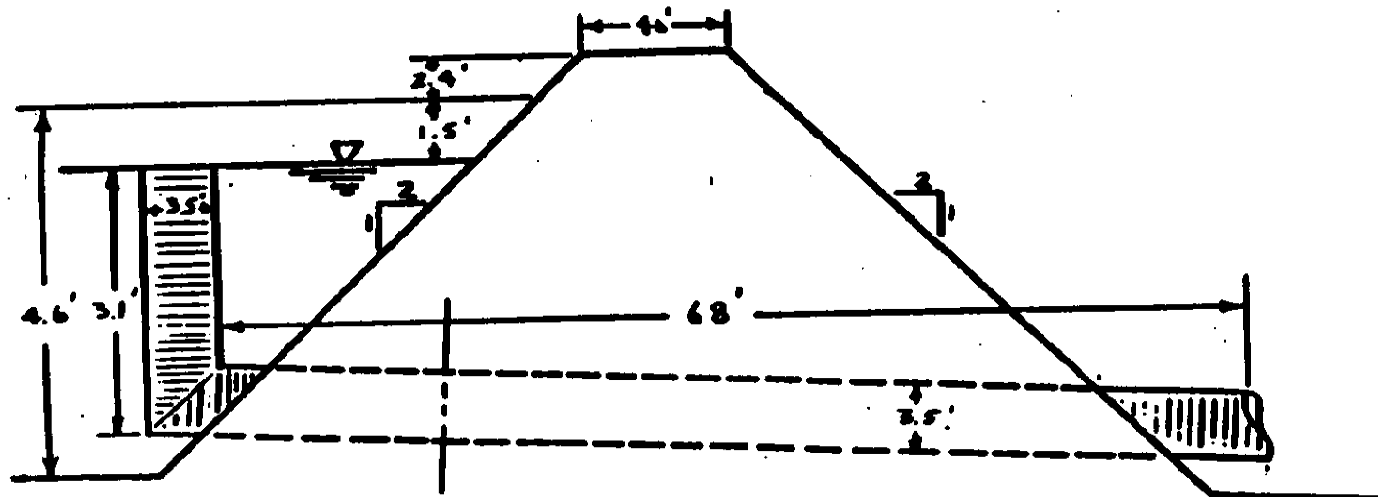
☒ YES NO (if yes, locate below)



Type: CMP  
 No. used: 1

### PLAN VIEW

See 1"=400' Map



Cross-Valley Pond  
 [Not to scale]

\*Note - Pond 033A discharges  
 to existing ditch A-3. (See 118 Map)

CONSOLIDATION COAL COMPANY MIDWESTERN DIVISION PICKETVILLE, ILLINOIS 62274			
SEDIMENT POND DATA			
DAM ID NO. <u>033A</u>			
DATE <u>12.3.84</u>	DATE		
COND	SCALE		
APPD	DRAWING NO.		
DRAWN <u>MAT</u>	SHEET OF		SEE

## SEDIMENT POND BS 4-9(0338)

### I. Design Information

Storm Event:	10 yr./24 hr.
Precipitation:	4.9 inches
Drainage Area:	159.7 acres + 19.9 ac (Pit Pumpage Conversion)
Hydrologic Group:	C
Runoff Curve No.	75
Pit Pumpage:	900 gpm

### II. Design Volumes

Conversion of Pit Pumpages:

$$(900 \text{ gpm}) / (45.2 \text{ gpm/ac}) = 19.9 \text{ ac}$$

Storm Runoff Volume:

$$(159.7 \text{ ac} + 19.9 \text{ ac})(0.083 \text{ ac-ft/ac}) = 14.9 \text{ ac-ft}$$

Sediment Storage Volume:

$$(159.7 \text{ ac} + 19.9 \text{ ac})(0.035 \text{ ac-ft/ac}) = \underline{6.3 \text{ ac-ft}}$$

$$\text{Total Design Storage Volume} = 21.2 \text{ ac-ft}$$

Minimum Design Surface Area:

$$\begin{aligned}(179.6 \text{ ac})(448 \text{ ft}^2/\text{ac}) &= 80,460 \text{ ft}^2 \\ &= 1.8 \text{ acres}\end{aligned}$$

### III. Pond Sizing

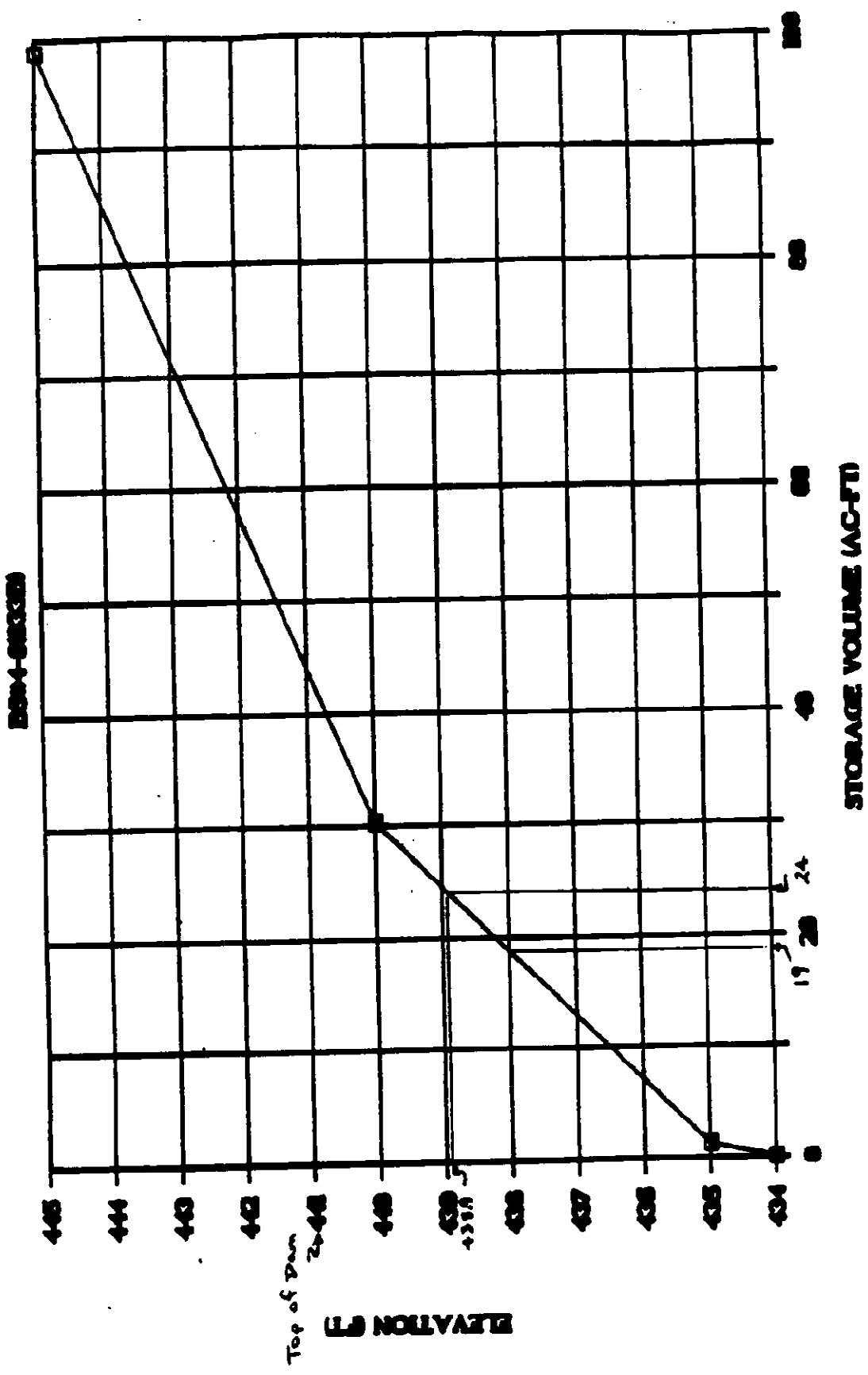
From elevation versus storage volume graph (following page), a cross valley impoundment with a depth of 4.0 feet would have a storage volume of 19 acre-feet (21.2 ac-ft needed to meet design volume). It is proposed to incise 16.3 additional Ac-Ft to meet the total runoff.

$$\text{Normal Pool Elevation} = 438.0$$

Surface Area:

$$\text{Approximate surface area of pond is } 6.5 \text{ acres ( } 1.8 \text{ acres).}$$

# STORAGE VOLUME VS. ELEVATION



#### IV. Spillway Sizing

CN = 75  
Slopes = Moderate  
Precipitation = 4.9 inches  
Drainage Area = 179.6 acres

##### A. 10 yr./24 hr. storm

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, page 10.21;

Direct runoff from 4.9 inches rainfall is 2.36 inches.

Therefore, total runoff volume is:

$$V_t = \frac{(179.6 \text{ acres})(2.36 \text{ inches})}{12 \text{ inches/ft.}}$$

$$V_t = 35.3 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ )

From SCS Engineering Field Manual, Chapter 2, Page  
2-65, Exhibit 2-10;

$$Q_p = 190 \text{ cfs}$$

##### B. 25 yr./24 hr. storm

Precipitation = 5.6 inches

1. Total runoff volume ( $V_t$ ) is;

From SCS National Engineering Handbook, Section 4  
Hydrology, Chapter 10, page 10.21;

Direct runoff from a 5.6 inch rainfall is 3.0 inches.

$$V_t = \frac{(179.6 \text{ acres})(3.0 \text{ inches})}{12 \text{ inches/ft}}$$

$$V_t = 44.9 \text{ ac-ft}$$

2. Peak runoff rate ( $Q_p$ );

From SCS Engineering Field Manual, Chapter 2, Page  
2-65, Exhibit 2-10;

$$Q_p = \underline{260 \text{ cfs}}$$

C. Outlet Capacity (25 yr/24 hr storm)

Since this pond is created behind a service road levee, no emergency spillway is proposed. The primary spillway, as designed below, is sized to handle a 25 year/24 hour storm.

Set the design maximum pool at an elevation of 438.9 feet, thus, allowing 0.9 feet of volume storage. Available volume storage is:

	<u>Volume</u>
Maximum pool elevation 438.9 ft	40.3 Ac-Ft
Normal pool elevation 438.0 ft	<u>35.3 Ac-Ft</u>
Available storage (Vs)	5 Ac-Ft

The volume stored vs total runoff volume ratio during a 10 yr/24 hr design storm is:

$$\frac{V_s}{V_t} = \frac{5.0 \text{ Ac-Ft}}{44.9 \text{ Ac-Ft}} = 0.11$$

The outflow versus inflow ratio from the Preliminary Hydraulic System Sizing Curve, Engineering and Design Manual Coal Refuse Disposal Facilities, page 6.201:

$$\frac{Q_o}{Q_p} = 0.86$$

$$Q_{out} = (0.86)(260 \text{ cfs})$$

$$Q_{out} = 224.0 \text{ cfs}$$

Volume: Incised Portion of Pond

Using 11' pool depth

Pond length = 700'

Surface area becomes

$$\frac{16.3 \text{ ac-ft}}{11 \text{ ft}} = 1.48 \text{ acres}$$

$$\text{Average width} = \frac{1.48 \times 43560}{700} = 92'$$



#### D. Outlet Sizing

With 0.9 foot a head, a drop inlet structure can be assumed to be under orifice flow conditions.

$$Q = C' a \sqrt{2gH} \quad \text{When } C' = 0.6$$

$$224 \text{ cfs} = 0.6 (a) \sqrt{2(32.2)0.9}$$

$$224 \text{ cfs} = 4.57(a)$$

$$a = 49.0 \text{ ft}^2 \text{ (required area of pipe for flow of 41 cfs)}$$

Cross sectional area of pipe:

$$a = \frac{\pi D^2}{4} \quad D = \text{pipe diameter}$$

$$49.0 = \frac{3.14 (D^2)}{4}$$

$$D^2 = 62.4 \text{ ft}^2$$

$$D = 7.90 \text{ feet}$$

Use 2 pipes diameter of 4 feet.

# HYDROLOGIC DATA

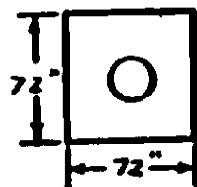
Design storm 10YR-24HR  
 Precipitation amount 4.9 (in) Curve number 75  
 Drainage area 159.7 (acres) Pit pumpage 900 (gpm)  
 Hydrologic soil group C Runoff volume 35.3 (ac-ft)

# IMPOUNDMENT DATA

Sediment volume 6.3 (ac-ft)  
 Surface area at normal pool 6.5 (ac)  
 Volume at normal pool 35.3 (ac-ft)  
 Maximum depth at normal pool 4.0 (ft)

# ANTI-SEEP COLLARS

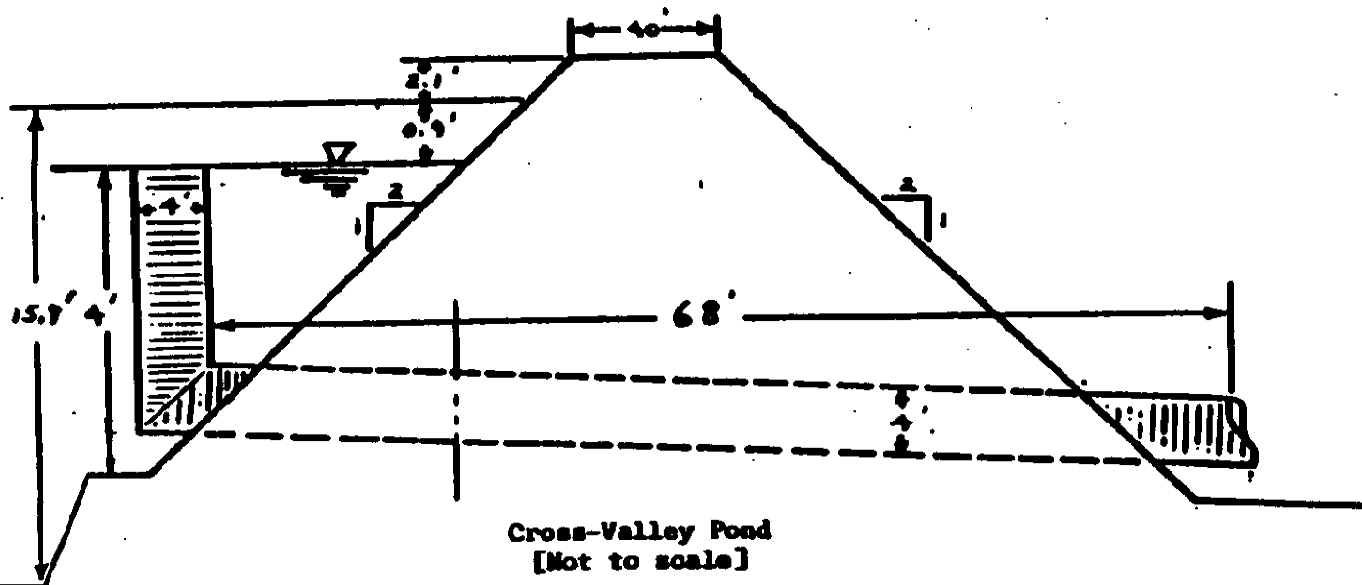
☒ YES ☐ NO (if yes, locate below)



Type: CMP  
 No. used: 1

# PLAN VIEW

See 1" = 400' Map



CONSOLIDATION COAL COMPANY  
 MIDWESTERN DIVISION  
 PINEBETTERVILLE, ILLINOIS 62450

SEDIMENT POND DATA  
 DAM ID NO. 033B

DATE	<u>B.S. #4</u>	DATE	
CODE		SCALE	
APPD		DRAWING NO.	
DESIGN	<u>11/17</u>	SHEET OF	



Illinois Environmental Protection Agency

2200 Churchill Road, Springfield, IL 62706

217/785-0746

Consolidation Coal Company -- Burning Star #4 (Perry Co.) IEPA Log #4018-84, SM-1 #120 Experimental Practices

April 27, 1984

Consolidation Coal Company  
Post Office Box 218  
Pinckneyville, Illinois 62274

Gentlemen:

We received your application for Permit and supporting information concerning the above referenced project on March 13, 1984. This application has been reviewed by the Permit Section Staff, and based upon that review, the following items are offered for your consideration and appropriate action:

1. You should also establish a surface water monitoring program to evaluate the runoff prior to treatment to assure compliance with the Act and Subtitle D upon completion. The runoff should be analyzed for pH, acidity/alkalinity, sulfates, chloride, iron, suspended solids and settleable solids. Since the existing treatment or an approved alternate is required for this drainage, the proposed frequency for groundwater monitoring should be sufficient to show the expected characteristics during the duration of this project.
2. A conventional abandonment plan should be submitted as requested in our letter dated November 12, 1982 (6123-02) for this area in accordance with 35 Ill. Admin. Code 405.10(a) and (f) and 405.109, in case the project no longer appears likely to meet the requirements of the Act or Subtitle D, Chapter 1.

The Agency will be pleased to re-evaluate your permit application on receipt of your written request and the necessary information and documentation to correct or clarify the deficiencies noted above. If this application is being used jointly as an application for a Department of Mines and Minerals Mining Permit and an Illinois EPA Mining Permit, we suggest that the above information be submitted through the Department of Mines and Minerals as a modification of the application. If you choose to submit the information directly to the Agency, please submit two (2) copies of the response and refer to the log numbers noted in the above subject heading.

Please be advised that any opening, reopening, abandonment, or operation of a mine or mine refuse area without first obtaining the required permits from this Agency would be a violation of State law. Although this Agency accepts the application form submitted through the

ILLINOIS DEPARTMENT OF RECORDS MANAGEMENT  
RELEASES

NOV 12 2015

REVIEWER: JKS

WR



Page 2

Illinois Department of Mines and Minerals as an application for a mining permit under Subtitle D, Chapter I, entitled "Mine Related Water Pollution", separate permits are issued. Approval of the application by the Department of Mines and Minerals is in no way to be considered approval by this Agency.

Should you have any questions or comments regarding the above, or need any additional information concerning Agency requirements, please contact me at the above telephone number and address.

Sincerely,

Edwin C. Bakowski  
Acting Manager, Permit Section  
Mine Pollution Control Program

ECB:ba/0887d/23-24

cc: Regional Office ✓  
Department of Mines and Minerals

EPA DIVISION OF RECORDS MANAGEMENT  
RELEASABLE

NOV 12 2015

REVIEWER: JKS

IEPA Consolidation Coal Co.  
Burning Star #4



STATE OF ILLINOIS  
DEPARTMENT OF MINES AND MINERALS  
LAND RECLAMATION DIVISION

RECEIVED

MAR 15 1984

MINE POLLUTION  
CONTROL PROGRAM

BRAD EVILSIZER  
Director

227 SOUTH 7TH ST. — RM. 204  
SPRINGFIELD, ILLINOIS 62708  
TELEPHONE: (217) 782-4970

MEMORANDUM

401884

TO: Ron Darden, Dept. of Agriculture  
Randy Vogel, Dept. of Conservation  
Ron Barganz, Environmental Protection Agency  
Ed Bakowski, Environmental Protection Agency  
David R. Boyce, Dept. of Transportation

FROM: Ernest Ashby, Permit Coordinator  
Land Reclamation Division

DATE: March 15, 1984

RE: Surface Mining Interagency Committee

Enclosed please find a 72 acre application for a surface coal mining and reclamation operations permit submitted by Consolidation Coal Company for their Burning Star #4 Mine under the Surface Coal Mining Land Conservation and Reclamation Act. The application number for this submittal is 120. The enclosed application is considered to be complete as defined under Regulation 1771.11(a)(1) and is being forwarded for your consideration and review.

Under the above listed Act, interagency committee members are provided up to 45 days in which to review and submit their comments on the application. Upon receipt, the comments will be forwarded to the County Clerk of Perry County to be incorporated into the public record.

EA:cs

cc: OSM

R. Dale  
D. Downing  
A. Meyers  
R. Lantz  
T. Johnson  
V. Ordija

RECEIVED

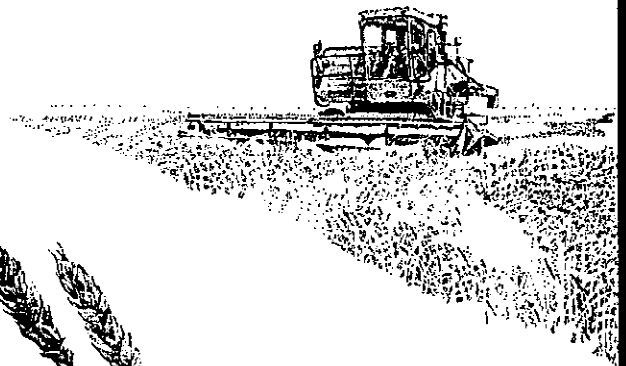
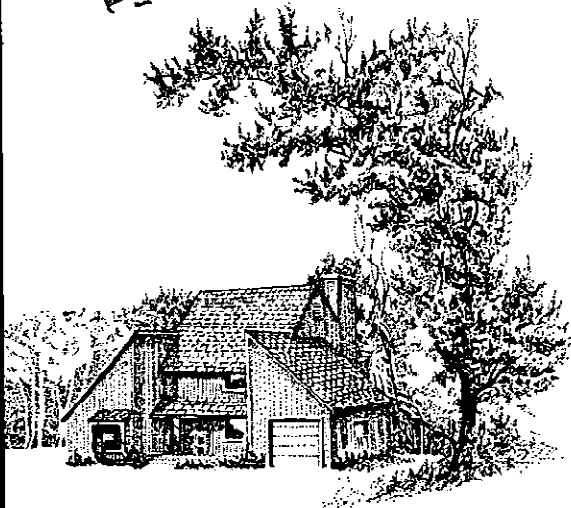
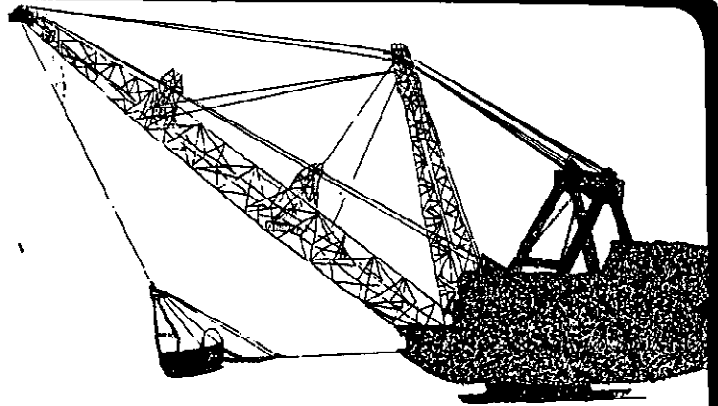
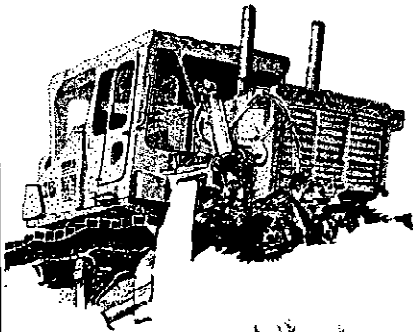
MAR 20 1984

DEPARTMENT OF RECORDS MANAGEMENT  
RELEASEABLE

NOV 12 2015

REVIEWER: JKS

*mgg*



CONSOLIDATION COAL COMPANY

BURNING STAR NO. 4

EXPERIMENTAL PRACTICES

SM-1 APPLICATION

401884

EPA-DIVISION OF RECORDS MANAGEMENT  
RELEASE

NOV 12 2015

REVIEWER: JKS



INDEX TO EXPERIMENTAL PRACTICES PERMIT APPLICATION

	<u>PAGE</u>
PART I    General Information Affidavits and Certificates	I-1   thru I-12
PART II   Pre-Mining Information	II-1   thru II-5
PART III  Hydro-Geologic Information	III-1   thru III-11
PART IV   Operations Plan	IV-1   thru IV-16
Part V    Reclamation Plan	V-1    thru V-32
Part VI   Experimental Practices Proposal	VI-1   thru VI-13

	<u>Scale</u>
Map A - U.S.G.S. Topographic Map	1"= 1000'
Map B - Pre-Mining Land Use Map	1"= 400'
Map C - Slurry Impoundment Site Map	1"= 400'
Map D - Mining Operations Plan	1"= 400'
Map E - Land Reclamation Plan	1"= 400'
Geologic Cross Sections	

RECEIVED  
MAR 20 1984  
MINERAL CONTROL PROGRAM

RECEIVED  
SPRINGFIELD

MAR 12 1984

DEPT. OF MINES AND MINERALS  
LAND RECLAMATION DIV.

## RECEIVED

MAR 15 1984

## MINE POLLUTION

# CONTROL of PROGRAM

DATE: August 30, 1983

RECEIVED

401884

MAR 20 1984

(Name of Company, Corporation, Partnership or Individual)

(618) 357-5302  
(Tel. No.)

(for, renewal or revision)

For Experimental Practices (surface mining, coal recovery operation)	Five Years		
	(Month)	(Date)	(Year)

(Month) (Day) (Year)

map. Revision No. \_\_\_\_\_ for \_\_\_\_\_ acres to be added to Permit No. \_\_\_\_\_.

Name of Mine \_\_\_\_\_, MSHA ID No. \_\_\_\_\_

(applicant or applicant's legal representative)

hereby affirm that all information provided in this application is true and correct to the best of my knowledge.

Signature of Official

Subscribed and sworn to before me this 22nd day of June, 1983

My commission expires April 28, 1987

This application is also to be used to apply for a:

IEPA Chapter 4 Permit Yes X No     

## Construction

**Operation**

Renewal

Modification	X
--------------	---

Notary Public

NPDES      Yes                      No      X

## Construction

Operation

Renewal

### Modification

If this application is to be considered an NPDES application, the attached, "Consolidated Permits Program - Applicant Form 2C," must be completed.



I John Shotton  
(applicant or applicant's legal representative)

hereby waive my right of the 90-day permit issuance deadline as required by the Illinois Environmental Protection Act, Section 39(a)(4) and the Illinois Pollution Control Board Rules and Regulations, Chapter 3, Rule 961 (b).

Mine Address	Pit No. or Name	Acres to be Permitted	Location			County
			Sec.	Twp.	Range	
Burning Star No. 4	Experimental Practices	72	33-34	5S	4W	Perry
RR 1 - Cutler, IL	Refuse Area					

TOTAL ACRES \_\_\_\_\_

Mailing Address RR 1 - Cutler, IL Telephone No. (618) 497-2176

Name of Operator Same as applicant  
(if different from applicant) (address) (Tel. No.)

Indicate the type of disturbance and associated acreage.

Acre

Type of Disturbance

Area Stripping

Mine Waste Areas

Processing Areas & Support facilities

Access, Haul Roads, & Transport facilities

Soil Storage Areas

Diversions

Auger Mining

Contour Stripping

Steep Slopes (37%+)

Coal Recovery (Gob & Slurry)

Other - Experimental Practices

72

- 2) Provide name and address of every legal or equitable owner of record of the permit area.

Consolidation Coal Company  
P. O. Box 218  
Pinckneyville, IL 62274

Provide name and address of the owner of record for all surface and subsurface areas contiguous to any part of the proposed permit area.

Consolidation Coal Company  
P. O. Box 218  
Pinckneyville, IL 62274

Provide location of surface owners of record on premining land use map or another map if necessary.

Consolidation Coal Company is the owner of record of all surface areas within and adjacent to the proposed permit.

- 3) Provide name and address of any holder of record of leasehold interest for the permit area.

None

- 4) Provide name and address of any purchaser of record under a real estate contract of the property for the permit area.

None

- 5) The applicant is: \_\_\_\_\_ corporation,   X   partnership, \_\_\_\_\_ single proprietorship, \_\_\_\_\_ association or other business entity. For businesses other than single proprietorship provide the following information:

A) Names and addresses of every officer, partner, director, or other person performing a function similar to a director of the applicant;

Please see previously submitted booklet entitled  
"Consolidation Coal Company, Corporation Data".

B) Name and address of any person who is a principal shareholder of the applicant; and

See note above under question 5(A).

C) Names under which the applicant, partner, or principal shareholder previously operated a surface coal mining operation in the United States within the 5 years preceding the date of application.

See note above under question 5(A).

D) Name, address and telephone number of the resident agent who will accept service of process.

See note above under question 5(A).

- 6) If any owner, holder, purchaser or operator is a business entity other than a single proprietor, provide the names and addresses of their respective principals, officers and resident agents.

See note above under question 5(A).

- 7) Provide a statement of any current or previous coal mining permits in the United States held by the applicant within the 5 year period preceding the date of submission of the application, and by any person identified in (b) (3) of this particular Section, and of any pending permit application to conduct surface coal mining and reclamation operations in the United States. The information shall be listed by permit or application number and identify the regulatory authority for each of those coal mining operations.

See note above under question 5(A).

- 8) Provide a statement of all lands, interest in lands, options or pending bids on interest held or made by the applicant, for lands which are contiguous to the permit area.

None

- 9) Provide a listing of each violation notice received by the applicant in connection with any surface coal mining operation during the 3-year period before the application date, for violations of of any law, rule, or regulation of the United States or of any State law, rule, or regulation enacted pursuant to Federal law, rule, or regulation, or of any provision of the Act pertaining to air or water environmental protection. The application shall also contain a statement regarding each violation notice, including--

Please refer to previously submitted booklet entitled, "Consolidation Coal Company History of Violations", for responses to Item A through E below.

A) The date of issuance and identity of the issuing regulatory authority, department, or agency;

B) A brief description of the particular violation alleged in the notice;

C) The date, location, and type of any administrative or judicial proceedings initiated concerning the violation, including, but not limited to, proceedings initiated by the applicant to obtain administrative or judicial review of the violations;



Agency ID: 170001458367

Media File Type: WATER

Bureau ID: W1458990016

Site Name: Consolidation Coal burning Star4

Site Address1: 2.5 Miles NE Of

Site Address2:

Site City: Cutler

State: IL

Zip: 62274-

**This record has been determined to  
be partially or wholly exempt from  
public disclosure**

**Exemption Type:**

**Redaction**

**Exempt Doc #: 11**

**Document Date: 7/19/2010**

**Staff: JKS**

**Document Description:** PERMIT APPLICATION - EXPERIMENTAL PRACTICES: PART 1 (DATED:  
03/20/1984)(VOLUME 11)

**Category ID:** 16

**Category Description:** NPDES PERMITS/BACKUP

**Exempt Type:** Redaction

**Permit ID:** IL0052795

**Date of Determination:** 11/12/2015

10) Affidavits, Certifications, Insurance Certificate

A) Complete affidavit regarding bond forfeiture or permit suspension. If forfeiture has occurred, provide information about applicant's present financial condition which would provide assurance that no further forfeiture would be expected.

Please refer to Permit Suspension Affidavit on Page I-11

B) Complete affidavit regarding applicant's legal right to enter and mine. Identify the documents upon which affidavit is based by type and date of execution and identify specific lands to which each document pertains. If the private mineral estate to be mined has been severed from the private surface estate, provide copies of the documents required under Rule 1788.15(b)(1)-(3).

Please refer to Page No. I-10 for completed affidavit regarding Consolidation Coal Company's legal right to enter and mine. Please see the listing of documents below in which this statement is based.

<u>Section</u>	<u>Tract #</u>	<u>Grantee</u>	<u>Grantor</u>	<u>Conv.</u>	<u>Date</u>
33	026-074	Consol	[REDACTED]	WD 271/81	3-6-70
			S $\frac{1}{2}$ , N $\frac{1}{2}$ , SE & S $\frac{1}{2}$ SE - (also see Sec. 34) Reserves silo & feed bank if removed prior to use for mining.		
34	026-083	Consol	[REDACTED]	WD263/499	6-18-70
		Parts of SW SW - Exec. O&G			
34	026-074A	Consol	[REDACTED]	WD260/485	12-26-69
		E.W. et ux NW SW-Exec. O & C			

C) Complete certification for engineering aspects of the application. In addition to the general certification, three specific certifications are included which are applicable only if the box in front of each are marked. The first two cover special permit requirements and should be marked only when they occur for the proposed permit. The third certification covers the Illinois Environmental Protection Agency permit requirements. In most cases, an Illinois registered engineer will be required to certify I.E.P.A. permit requirements.

Please refer to attached engineering certificate on page I-12.

D) Provide a certificate of liability insurance or evidence that the applicant is self-insured.

Please refer to attached certificate of Liability Insurance and Self Insurance on pages I-7,8,9.

- 11) Provide the name of local newspaper of general circulation in which advertisement of application will be published. Certificate of publication is to be submitted not later than 4 weeks after the last date of publication.

The Democrat - Pinckneyville, Illinois

- 12) Areas Designated Unsuitable for Mining

Does the proposed permit area contain areas designated unsuitable for surface mining activities or under study for designation in an administrative proceeding as unsuitable for surface mining activities? (1764 and 1765).

The proposed permit area does not contain any areas designated or under study for designation as unsuitable for surface mining activities.

# Certificate of Insurance

**Word**

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER.  
THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES LISTED BELOW.

<b>NAME AND ADDRESS OF AGENCY</b> Marsh & McLennan, Inc. 1221 Avenue of the Americas New York, NY 10020	<b>COMPANIES AFFORDING COVERAGES</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">COMPANY LETTER</td> <td><b>A</b></td> </tr> <tr> <td></td> <td>Hartford Accident &amp; Indemnity Company</td> </tr> <tr> <td>COMPANY LETTER</td> <td><b>B</b></td> </tr> <tr> <td>COMPANY LETTER</td> <td><b>C</b></td> </tr> <tr> <td>COMPANY LETTER</td> <td><b>D</b></td> </tr> <tr> <td>COMPANY LETTER</td> <td><b>E</b></td> </tr> </table>	COMPANY LETTER	<b>A</b>		Hartford Accident & Indemnity Company	COMPANY LETTER	<b>B</b>	COMPANY LETTER	<b>C</b>	COMPANY LETTER	<b>D</b>	COMPANY LETTER	<b>E</b>
COMPANY LETTER	<b>A</b>												
	Hartford Accident & Indemnity Company												
COMPANY LETTER	<b>B</b>												
COMPANY LETTER	<b>C</b>												
COMPANY LETTER	<b>D</b>												
COMPANY LETTER	<b>E</b>												
<b>NAME AND ADDRESS OF INSURED</b> Consolidation Coal Company Consol Plaza 1800 Washington Road Pittsburgh, PA 15241													

This is to certify that policies of insurance listed below have been issued to the insured named above and are in force at this time. Notwithstanding any requirement, term or condition of any contract or other document with respect to which this certificate may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions and conditions of such policies.

COMPANY LETTER	TYPE OF INSURANCE	POLICY NUMBER	POLICY EXPIRATION DATE	Limits of Liability in Thousands (000)		
					EACH OCCURRENCE	AGGREGATE
A	<b>GENERAL LIABILITY</b>			<b>BODILY INJURY</b>	\$	\$
	<input checked="" type="checkbox"/> COMPREHENSIVE FORM	10 CLR P12421E	1-1-83/84	<b>PROPERTY DAMAGE</b>	\$	\$
	<input checked="" type="checkbox"/> PREMISES—OPERATIONS	10 CLR P12421E	1-1-83/84			
	<input type="checkbox"/> EXPLOSION AND COLLAPSE HAZARD					
	<input type="checkbox"/> UNDERGROUND HAZARD					
A	<input checked="" type="checkbox"/> PRODUCTS/COMPLETED OPERATIONS HAZARD	10 JPR P12422E	1-1-83/84	<b>BODILY INJURY AND PROPERTY DAMAGE COMBINED</b>	\$ 1,000	\$
A	<input type="checkbox"/> CONTRACTUAL INSURANCE	10 CLR P12421E	1-1-83/84			
A	<input checked="" type="checkbox"/> BROAD FORM PROPERTY DAMAGE	10 CLR P12421E	1-1-83/84			
A	<input type="checkbox"/> INDEPENDENT CONTRACTORS	10 CLR P12421E	1-1-83/84			
A	<input checked="" type="checkbox"/> PERSONAL INJURY	10 CLR P12421E	1-1-83/84	<b>PERSONAL INJURY</b>		\$
<b>AUTOMOBILE LIABILITY</b>				<b>BODILY INJURY (EACH PERSON)</b>	\$	
<input type="checkbox"/> COMPREHENSIVE FORM				<b>BODILY INJURY (EACH ACCIDENT)</b>	\$	
<input type="checkbox"/> OWNED				<b>PROPERTY DAMAGE</b>	\$	
<input type="checkbox"/> HIRED				<b>BODILY INJURY AND PROPERTY DAMAGE COMBINED</b>	\$	
<input type="checkbox"/> NON-OWNED						
<b>EXCESS LIABILITY</b>				<b>BODILY INJURY AND PROPERTY DAMAGE COMBINED</b>	\$	\$
<input type="checkbox"/> UMBRELLA FORM						
<input type="checkbox"/> OTHER THAN UMBRELLA FORM						
<b>WORKERS' COMPENSATION and EMPLOYERS' LIABILITY</b>				<b>STATUTORY</b>	\$	(EACH ACCIDENT)
<b>OTHER</b>						

**DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES**

**OPERATIONS:** All operations usual to the business of the insured, including surface mining and reclamation operations in the State of Illinois.

RECEIVED

**Cancellation:** Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will endeavor to mail 10 days written notice to the below named certificate holder, but failure to mail such notice shall impose no obligation or liability of any kind upon the company.

APR 20 1983

INS DEPT

**NAME AND ADDRESS OF CERTIFICATE HOLDER**

Illinois Department of Mines & Minerals  
 Division of Land Reclamation  
 227 South Seventh Street  
 Room 204  
 Springfield, IL 62706  
 Attn: Permit Coordinator

DATE ISSUED April 15, 1983

*Frank Prentice Hapgood*

AUTHORIZED REPRESENTATIVE

Frank Prentice Hapgood

STATE OF ILLINOIS  
INDUSTRIAL COMMISSION  
160 N. LASALLE ST., CHICAGO, ILL 60601

SELF-INSURANCE  
CERTIFICATE OF APPROVAL

**WORKMEN'S COMPENSATION ACT and WORKMEN'S OCCUPATIONAL DISEASES ACT**

It is herewith certified that Consolidation Coal Company - Midwestern Region - Illino  
Name of Employer  
of 3300 One Oliver Plaza, Pittsburgh, Pennsylvania 15222 has the approval of the  
Address

Industrial Commission of Illinois to act as a self-insurer as provided for in Section 4 of the Workmen's Compensation Act and Workmen's Occupational Diseases Act of Illinois.

Effective as of the 1st day of January, A. D. 19 76.

Dated at Chicago this 19th day of January, A. D. 19 76.

INDUSTRIAL COMMISSION OF ILLINOIS

Melvin L. Rosenbloom  
Chairman

(SEAL)

NOTICE

By the acceptance of this Notice of Approval, the recipient agrees to become subject to the Workmen's Compensation Act and Workmen's Occupational Diseases Act of Illinois, and as often as the Commission may demand, file on forms prescribed evidence of compliance with the provisions of said Act.

Form I.C. 43 (47581-4M-1-73) 14

MLR:rl/pr





# INDUSTRIAL COMMISSION

STATE OF ILLINOIS

160 NORTH LA SALLE STREET / CHICAGO, ILLINOIS 60601 / PHONE: 312/793-2300

January 19, 1976

Consolidation Coal Company -  
Midwestern Region - Illinois  
3300 One Oliver Plaza  
Pittsburgh, Pennsylvania 15222

Gentlemen:

We are enclosing herewith our regular Certificate of Approval granting you permission to carry your own risk without insurance, as is provided for by Section 4 of the Illinois Workmen's Compensation Act and the Illinois Workmen's Occupational Diseases Act.

This Certificate will remain in effect until terminated by the Industrial Commission. The employer, by acceptance of this Certificate, agrees to the conditions set forth in the application heretofore filed with this Commission, and to give such further information with reference to its operations and financial statement as the Commission from time to time may require.

To maintain our records in current form, the Commission should be advised of any change in the corporation.

Sincerely,

Melvin L. Rosenbloom  
Chairman

MLR:rl  
Enclosure

(I) (We) JOHN A GEFERTH  
(Individual or Individuals)

hereby affirm on behalf of the applicant, CONSOLIDATION COAL CO.,  
that said applicant has valid documents which bestow upon the applicant a legal  
right to enter and commence surface coal mining and reclamation operations upon  
lands contained in the proposed permit area, and such legal right is not in any  
way the subject of pending court litigation.

Dated this 2<sup>ND</sup> day of JUNE, 1983.

John A. Geferth Senior Land Agent  
Signature Title

Subscribed and sworn to before me this 2<sup>ND</sup> day of June,  
1983.

Raymond A. Raucher  
Notary Public

My commission expires: April 1, 1987  
Date

(I) (We) John Shotton  
Individual(s)

hereby affirm on behalf of the applicant, Consolidation Coal Company,  
that said applicant, or subsidiary or affiliate thereof, or persons controlled  
by or under common control with the applicant (has) (has never) held a Federal  
or State mining permit which in the five-year period prior to the date of sub-  
mission of this application has been suspended or revoked, and (has) (has never)  
had a mining bond or similar security deposited in lieu of bond forfeited.

(If "has" was the appropriate choice in either case above, please give as  
part of this sworn affidavit a brief explanation of the facts involved in such  
suspension, revocation or forfeiture. If more space is needed, attach additional  
sheets).

Please refer to the previously submitted booklet entitled, "Consolidation  
Coal Company History of Violations" for details regarding permit suspensions.

Dated this 22nd day of June, 19 83.

x John A. Shotton  
Signature

V.P. Oper.  
Title

Subscribed and sworn to before me this 22nd day of June,  
19 83.

Anna Margaret Hamilton  
Notary Public

My commission expires: April 28, 1987  
Date

Burning Star No. 4 Experimental Practices

ENGINEERING CERTIFICATION

I hereby certify the engineering design used in preparation of this application, attachments, and supplements was done by me or under my direct supervision.

I further certify to the best of my knowledge all such design is in accordance with all applicable local, state and federal laws, rules and regulations.

☒ Whereas the Reclamation Plan calls for an alternative land use, I also certify the plans conform to applicable accepted standards for adequate land stability, drainage vegetative cover, and aesthetic design appropriate for the post-mining use of the site.

☒ Whereas the operation proposes disposal of spoil or waste materials in areas other than mine workings or excavations, I also certify such fills are designed in accordance with recognized professional standards and all applicable laws.

☒ Certification for Illinois Environmental Protection Agency - Chapter 4 Permit  
In my professional judgement, the plans and specifications submitted as part of this application describe an operation which will meet all applicable effluent and water quality standards. I certify that I am familiar with all of the plans, specifications, reports, and maps submitted as part of this application and that said plans, etc. are accurate insofar as they represent existing conditions.

Victor Ordija

Name

62-37682

Illinois Registration Number (Seal)

Consolidation Coal Company

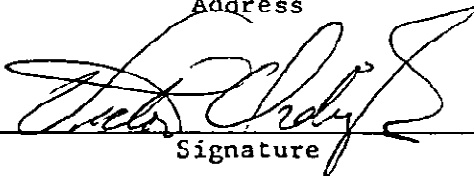
Firm

312-351-5302

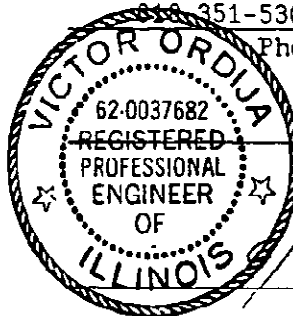
Phone Number

P.O. Box 218 Pinckneyville, IL 62274

Address



Signature



2/83  
Date

The measures indicated herein to be taken by Consol in regard to mining and reclamation activities are based upon legal requirements as they exist at the time of filing. Consol reserves its right to revise these measures if applicable legal requirements are later determined to be invalid or less extensive in scope.

Burning Star No. 4 - Experimental Practices

## PART II

### PREMINING INFORMATION

Premining information is to be displayed on premining land use map unless otherwise indicated.

- 1) Describe how the permit area perimeter will be marked and discuss the method or system employed to locate permit area perimeter and set markers along it.  
Designate a reference point outside of the permit area. Provide a description of the reference point and a sketch relating the reference point to the permit area perimeter.

Permit perimeter markers will consist of color-coded steel posts. The perimeter will be established by a survey crew.

The reference point is located on the pre-mining land use map. The reference point is approximately 1800' north of the south line of Section 27 on Jamestown Road. The state coordinates for this point is 508697.41 N and 6888687.96E.

- 2) A. Provide a generalized description of the overburden in terms of thickness and character, e.g., (loess 10', glacial till 15', shale 3', coal 4') down to and including the first aquifer to be affected below the lowest coal seam to be mined. Are provisions of Rules 1816.104 (thin overburden) or 1816.105 (thick overburden) applicable?

The proposed permit area consists of an inactive above ground slurry refuse impoundment.

- B. Provide analyses of each stratum down to and including the stratum immediately below the lowest coal seam to be mined. (1779.14(b)(1)(i-iv).

The coal seam will not be mined or affected within the proposed permit area.

- C. Provide coal seam(s) name and number and an analyses of the coal seam(s) as to sulfur, pyrite, and marcasite content.

Not applicable. The coal seam will not be mined or affected within the proposed permit area.

- 3) Provide slope measurements to represent existing land surface configuration of proposed permit area as required under Rule 1779.25(k)(1-3). A soils map of medium intensity prepared to SCS specifications or a contoured aerial photo may be submitted in lieu of 1779.25(k)(1-3).

Please refer to the attached figure 2A on page II-5 for the representative slope measurements.

- 4) Has some or all of the land been disturbed previously by surface or deep mining? Yes X No \_\_\_\_\_. If yes, delineate on the premining land use map the degree of reclamation and, if applicable, that state law under which reclamation was accomplished. What coal seam or other mineral was extracted? Check one or more:

\_\_\_\_\_ Pre-law  
\_\_\_\_\_ Open Cut Land Reclamation Act (1962)  
\_\_\_\_\_ The Surface-Mined land Reclamation Act (1968)  
X \_\_\_\_\_ Surface-Mined Land Conservation and Reclamation Act (1971)  
\_\_\_\_\_ Surface-Mined land Conservation and Reclamation Act, (Amended 1975)  
\_\_\_\_\_ Deep Mining and Associated Disturbances

Describe condition of previous reclamation efforts. Describe and locate land uses adjacent to the previously affected area on the premining land use map.

The land within the proposed-permit area has been affected by construction of a slurry impoundment. Reclamation consists of revegetated berm and top areas.

- 5) Give the acreages of each land use within the proposed permit area, employing land use categories of Rule 1701.5 listed below, and delineate on premining land use map existing land uses in the proposed permit area and within 1,000 feet adjacent to it. Include on the premining land use map the location of all buildings and identify the current use of these buildings.

Cropland

Pasture land

Grading land

Forestry

Residential

Industrial/Commercial      72 acres

Recreation

Fish and Wildlife Habitat

Developed Water Resources

Undeveloped land or no current use or land management

- 6) Have any of the land uses changed within the last five years? Yes \_\_\_\_\_ No X \_\_\_\_\_. If yes, indicate the acreage and changes of land uses.

- 7) Give a description of the plant communities within the proposed permit area and delineate on a vegetation map the vegetative types occurring within the proposed permit area.

Please refer to Part VI for details of the plant communities within the proposed permit.

- 8) Has a survey of the permit and adjacent area been conducted for archaeological, cultural and historical resources? Yes \_\_\_\_\_ No X. If yes, provide date of survey and surveyors. Locate on the vegetation map or the land use map the following: the boundaries of any public parks, locations of any cultural or historical resources listed in the National Register of Historic Places, known archaeological sites, public or private cemeteries or Indian burial grounds located within 100 feet of the permit area or from which a 100 foot buffer zone is to be maintained.
- 9) Are there any public roads or transmission lines to be removed or relocated or temporarily closed? Yes \_\_\_\_\_ No X. If yes, indicate on the premining land use map which roads or lines are to be replaced or relocated or temporarily closed. Attach a copy of the written agreement from the appropriate authority authorizing the removal, relocation or temporary closure.

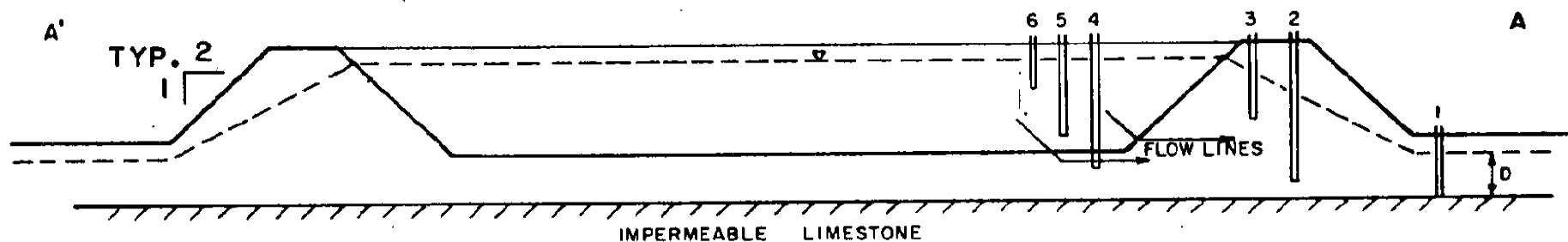
10) Soils Information and Map

There is no soils map available for the proposed permit area. All areas have been affected by cut and fill construction.

- A. Does the submitted soils map represent a map developed by the Soil conservation Service? Yes \_\_\_\_\_ No \_\_\_\_\_. If no, explain. If SCS map has been modified, explain.
- B. Do any of the map units in the permit area qualify as prime farmland? Yes \_\_\_\_\_ No \_\_\_\_\_. If yes, explain the status of these lands in regard to the requirements of Rule 1785.17, and/or negative determination criteria of Rule 1779.27(b).
- C. Delineate on the soils map(s) the area which will incur actual mining (removal of overburden and extraction of coal).
- D. For lands not subject to requirements of Rule 1785.17, submit acreage totals of each map unit (soil type and slope classification) and land use capability classes in the permit area. Describe the percent slope range of each lettered slope classification used on the soil map.
- E. List each map unit of High Capability Lands in the permit area and give acreages for each with respect to areas which will incur actual mining (removal of overburden and extraction of coal) and to areas which will incur other forms of disturbance (road, ditches, etc.).

- F. Indicate the average thickness of the A horizon of the different soil types to be permitted. Locate the test holes for Horizon-thickness sampling. List the results of these tests. List the soil types and acreages of areas that will require the B and/or the root medium necessary to obtain soil productivity consistent with the proposed post-mining land use.
- G. Are selected overburden materials proposed to be used in lieu of, or as a supplement to, the A horizon? Yes \_\_\_\_\_ No \_\_\_\_\_. If yes, attach a certification of the information required under 1816.22(e) by a qualified soil scientist or agronomist.





SCALE: VERT. - 1" = 50'  
HORIZ. - NONE

**CONSOLIDATION COAL COMPANY**  
**MIDWESTERN REGION**  
 PINEBURY HILLS, FULLINGBROOK DISTRICT

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**IDEALIZED CROSS SECTION**  
**SLURRY POND**  
**BURNING STAR NO. 4**

DATE	DRAWN	BY	FILE NO.
12/3/82	D.S.	PERRY	FIG. 2
		59	
		4W	

## PART III

### HYDRO-GEOLOGIC INFORMATION

#### 1) Regional Hydro-geologic Characteristics

- A. List the major and minor surficial aquifers of the mine area as described in Illinois State Geological Survey Publications 192, 198, 207, 212, 222, 225, Illinois State Survey publications for the area, other sources or personal knowledge.

No major surficial aquifers are present in the region as evidenced by Pryor (1956) and records of permitted water wells. Minor surficial aquifers may be located in stream valleys. According to Pryor (1956) thin water-yielding sand and gravel deposits are restricted to deeper parts of the Beaucoup Creek Valley in Perry County. Cahokia Alluvium, the deposits in flood plains and channels of modern rivers, are mostly poorly sorted sand, silt and clay (Zuehls, 1981).

- B. List the major and minor drift, bedrock valley, and buried bedrock valley aquifers of the area.

No major drift aquifers are present in or close to the permit area. Glacial deposits are Illinoian Stage, Glasford Formation (Zuehls et al., 1981). The Vandalia Till Member of the Glasford Formation covers the surrounding region and is overlain by loess or Holocene stage alluvium (Zuehls et al., 1981). Willman and others (1975) describe the Vandalia Till Member as "sandy till with lenticular bodies of silt, sand and gravel, calcareous except where weathered, generally gray and moderately compact".

No buried bedrock valleys are known to exist in the area.

- C. List the major and minor bedrock aquifers in the area.

No major bedrock aquifers are present in the area. Pennsylvanian age strata directly underly unconsolidated materials. A core test in Sec. 21, T5S, R4W determined a total Pennsylvanian thickness of 326.5 feet (Bell et al., 1931). The Pennsylvanian strata present are dominantly weak shales, thin limestones (less than 25'), thin sandstones of limited areal extent and coal layers (Csallany, 1966). Domestic, farm and small municipal water supplies can be developed from Pennsylvanian rocks (Csallany, 1966). These rocks generally have low porosities, and permeabilities and yield water through interconnected pores, cracks,

crevices, joints and bedding planes (Csallany, 1966). Due to increasing mineralization with depth production wells rarely penetrate over 300 feet of Pennsylvanian strata (Csallany, 1966).

In the southern Illinois area near B.S. No. 4 mine, the vast majority of water withdrawals are from surface water sources (Zuehls et al., 1981). Groundwater withdrawals in the area covered by Hydrology of Area 35 (Zuehls et al., 1981) accounted for 13% of the 170 million gallons per day total in 1978. Larger communities use surface-water impoundments for their water supplies. Groundwater is used mainly for rural domestic supplies and small industries (Zuehls et al., 1981 Csallany, 1966).

Several small communities (Steeleville, Percy, Cutler, Willisville, Campbell Hill and Ava) near the intersection of Randolph, Perry and Jackson Counties obtain water supplies from deep Pennsylvanian and Mississippian sandstones (total depth 350-550 feet) (Csallany, 1966). Total pumpage in 1981 for Cutler, Percy and Steeleville was 341,500 gallons per day (Private Communication, Illinois State Water Survey 1983).

D. List the generalized water yield, supply, and potential use of these aquifers.

Aquifer	Hydrologic Properties * Estimated K	Present Use	Potential Use
Major Surface	None Present	----	----
(1)Minor Surface	K=0.22-2.4	farm, domestic	farm, domestic
Major Drift	None Present	----	----
(1)Minor Drift	K=0.22-2.4	farm, domestic	farm, domestic
Major Bedrock Valley	None Present		
Minor Bedrock Valley	None Present		
Major Buried Bedrock Valley	None Present		
Minor Buried Bedrock Valley	None -- -- Present		
Major Bedrock	None Present		
Minor Bedrock		farm, domestic	farm, domestic
(2)Mississippian and Pennsylvanian	T = 205-640 from SS generally 350 to 550 feet below ground level K = 4.8, 5.5, 11.6 4.8-11.5 gpd/ft <sup>2</sup>	small municipal	small municipal

K = hydraulic conductivity units = gpd/ft<sup>2</sup>

T = transmissivity, units = gpd/ft

\* Estimated from Walton's (1962) method of relating specific capacity and transmissivity.

(1) Includes 3 monitoring wells and 3 private wells.

(2) Includes 2 private wells and range from Cutler municipal wells in Csallany 1966).

## 2) Area Specific Hydro-geologic Characteristics

- A. Describe the stratigraphic sequence of the overburden and the stratum lying immediately below the coal seam in terms of type of material, depth, thickness, the acid and mineralization potential permeability, porosity, and other hydrologic characteristics (attach a drillers' log from the mine area).

Two geologic cross sections through the B.S. No. 4 mine area are included (Map Pockets). Information on acid and mineralization potential is located in Part VI.

Hydrologic Characteristics summarized from drillers logs and pump tests on private, municipal and monitoring wells are presented in Table 1.

- B. Identify aquifers in the area, estimate the elevation of the water table, and identify on the hydrologic map the direction of groundwater flow in the area to be disturbed.

### Unconsolidated Materials

Glacial deposits in the mine vicinity are of the Glasford Formation, Illinoian Stage in the Pleistocene Series. (Willman & Faye, 1979) Around B.S. No. 4 mine the Glasford Fm is represented by the Vandalia Till Member (Zuehle et al 1981). It has been characterized as a sandy till, with thin lenticular bodies of silt, sand and gravel and is calcareous except where weathered (Willman and Frye, 1970). Illinoian glacial deposits are covered with approximately 5 feet of Peoria Loess, a massive well sorted silt (Zuehls et al 1981). Table 1 in this section shows estimated hydraulic properties of these materials in the mine area. Water table elevation is generally a reflection of surface topography (See Fig. 1). Information on the surface elevation and average water table elevation is given below for 5 monitoring wells at B.S. No. 4.

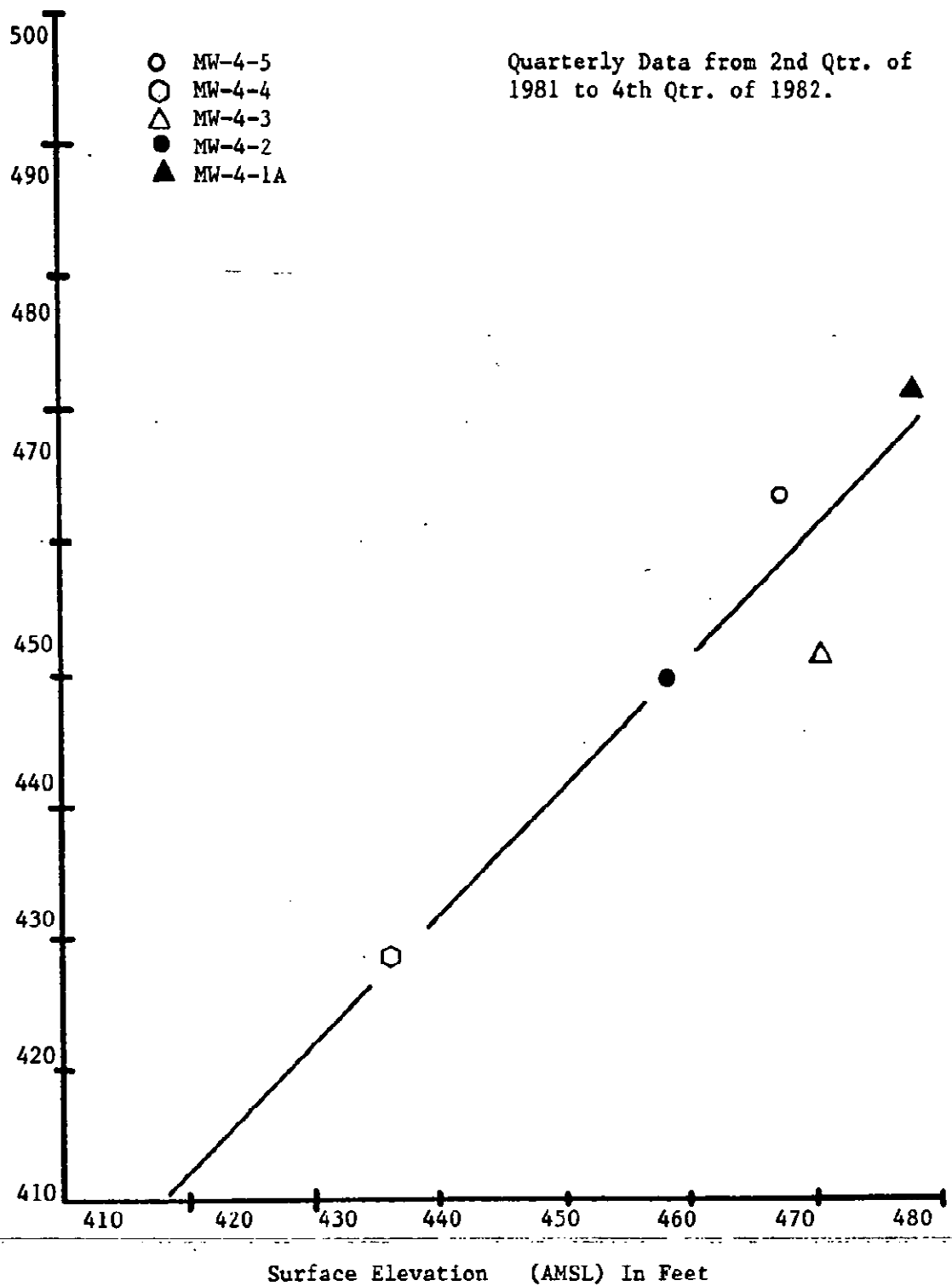
See Map A for direction of probable groundwater flow.

MW-4-1A	Ele. = 476.7
MW-4-2	Ele. = 458
MW-4-3	Ele. = 469.9
MW-4-4	Ele. = 435.6
MW-4-5	Ele. = 467

Burning Star No. 4 Mine

Average Water Table Elevation vs Surface Elevation

$$\text{Average Water Table Elevation} = 0.98 (\text{Surface elevation}) + 2.6$$
$$r = 0.94$$



<u>Well I.D.</u>	<u>Average Depth to Water</u>	<u>Ave. Wt. Elevation</u>
------------------	-------------------------------	---------------------------

MW-4-5	3.1	463.9
MW-4-4	7.4	428.2
MW-4-3	17.8	452.1
MW-4-2	8.0	450
MW-4-1A	4.9	471.8

$r = 0.94$  88% explained

Average Water Table Elevation =  $0.98$  (Surface El.) +  $2.6$

#### Bedrock Aquifers

Records of permitted water wells on file at ISGS covering the southern half of T5S, 4W and the northern tier of sections in T6S, 4W indicate deep sandstone layers are being tapped for water supplies. Several private wells and 3 wells for Cutler municipal water supply are completed in these strata at depths from 350'-550'.

Selected Hydraulic characteristics are estimated in Table 1. Probable direction of groundwater movement in deep Pennsylvanian and upper Mississippian strata is shown on Map A.

Static Water levels in these wells range 70-140 below ground level.

- C. Give the quantity of ground water to be removed as a result of this mining operation: \_\_\_\_\_ GPD; and indicate the aquifers and/or strata which are the source of this water.

No Mining. Not Applicable

- D. Describe the regional and local changes to the ground water systems which could result from this mining operation. Include the possible effects on water supplies and the precautions which will be taken to avoid these problems.

#### Unconsolidated Materials

Regional changes are expected to be nil since the areal extent of sand and gravel deposits is very limited. In general the unconsolidated deposits have low hydraulic conductivities. Neither dewatering or water quality degradation is expected to be a problem.

Locally there are no private wells in use within  $\frac{1}{2}$  mile of the permit boundaries. The nature of the earth materials present indicates problems with lowered water table or water quality beyond  $\frac{1}{2}$  mile of the permit boundary is extremely unlikely.

#### Bedrock Aquifers

Both regionally and locally deep (350'550') Pennsylvanian and Mississippian sandstone aquifers are the primary bedrock water source. Strata between the level of the Harrisburgh No. 5 coal and the Pennsylvanian and Mississippian sandstones consist of alternating layers of limestone, shale, coal and minor sandstone. These will effectively isolate the sandstone strata from water quality changes due to surface disturbances. Also Static levels are approx. 100' below ground surface, not significantly different from strata above #5 coal. Therefore, there is not a large head differential present which would cause significant leakage through upper Pennsylvanian strata to the deep sandstones. No ill effects to these aquifers due to mining have been documented.



Table 1

Summary of Aquifer Characteristics  
Burning Star No. 4 Mine

Well I.D.	Total Depth (ft)	Water Bearing Strata	Specific Capacity (GPM/ft)	Est. $K_2^*$ (GPD/ft <sup>2</sup> )
MW-4-2	30.8	Unconsolidated	0.16	0.71
MW-4-3	27.4	Unconsolidated	0.15	2.6
MW-4-5	78.4	Unconsolidated	0.34	2.5
Immanual	76	Unconsolidated	0.22	1.5
Lutheran Ch				
BS4-43	71	Unconsolidated	0.05	0.22
13-5S-4W	38	Unconsolidated	0.18	2.4
BS4-26	425	Sandstone 384-425	0.16	5.5
BS4-25	430	Sandstone 387-430	0.15	4.8
(1) Cutler Municipal Well #1	550	Sandstone	0.43	11.6

\* Estimated from Walton's (1962) method of relating specific capacity and transmissivity.

(1) From Sander Csallany 1966 App. A.

- E. Name the watershed and the location of all surface water bodies, lakes, streams ponds and springs which are expected to receive discharges or drainages from the proposed mining area, and describe the chemical, physical, and biological conditions of these water bodies under seasonal flow conditions. Provide water quality data on the characteristics listed below for all surface waters:

Total dissolved solids (mg/l)  
 Total suspended solids (mg/l)  
 Acidity  
 pH in standard units  
 Total iron (mg/l)  
 Total manganese (mg/l)

The permit area is located within the watershed of Galum Creek, tributary to Beaucoup Creek. It has been channelized and temporarily or permanently diverted in several locations. It is an intermittent stream with an average bank to bank width of about 10 feet and with steep muddy banks in the undisturbed portions. High flows are experienced generally in the spring and to a lesser extent in the fall due to seasonal precipitation. Flows often cease completely in the summer, resulting in high water temperature and low dissolved oxygen conditions (Flemal).

Average, range and standard deviation data are given for the requested water quality parameters in table 2. Sites upstream G-1 and downstream G-3 are presented

Table 2  
 Water Quality Characteristics - Galum Creek  
 1981 Data

	G-1			G-3		
	Range	Average	Std. Dev.	Range	Average	Std. Dev.
pH	6.3-8.2	7.1	0.53	6.2-8.8	7.4	0.7
Tot.Fe	0.6-33	5.9	8.8	0.4-32	4.7	8.7
Acidity	14-206	0	-	351-56	0	-
TSS	7-1868	333	529	20-1860	247	521
TDS	152-2818	576	601	356-3492	1358	1042
Tot.Mn	0.06-1.38	0.48	0.36	0.17-1.37	0.48	0.33

n = 16

n = 12

Water quality data for Galum is tabulated and summarized in Part V Question 10.

No seasonal water quality trends were noticed in the 1981 data. In general high levels of total iron occurred at high flows while high TDS levels occurred at low flows.

- F. Identify the general land uses of the watersheds upstream of the proposed mining area and any potential pollution sources which could significantly affect the stream quality at the mine area.

Watersheds upstream of the proposed permit area, along Galum Creek, are made up largely of active mining areas, cropland and pasture. During heavy rainfall periods, erosion from cropland upstream may cause high levels of total dissolved and suspended solids. Since all runoff from the proposed permit area is passed through sediment control structures while the area is being affected, no pollution is expected to be contributed by the mine area.

- G. List all public water supplies within 10 miles of the proposed permit boundaries.

Several surrounding communities utilize deep Pennsylvanian and Mississippian sandstone strata as a water supply. The locations and available data on the wells are shown in table 3.

Public Water Supplies Within  
10 Mile Radius

Table 3

County	Municipality	Well #	Location	Depth	Aquifer	1981 Pumpage
Perry	Cutler	1	6S,4W Sec.5	550	M	0
	Cutler	2	6S,4W Sec.5	575	M	20,000 GPD
	Cutler	3	6S,4W,Sec.5	595	M	20,000 GPD
Randolph	Percy	1	6S,5W,Sec.11	427	M	45,000 GPD
	Percy	2	6S,5W,Sec.11	430	M	42,000 GPD
	Sparta		5S,5W,Sec.6	NA	NA	571,375 GPD
	Steeleville	1	6S,5W,Sec.16	285	M	41,000 GPD
	Steeleville	2	6S,5W,Sec.16	319	M	0
	Steeleville	3	6S,5W,Sec.16	319	M	63,000 GPD
	Steeleville	4	6S,5W,Sec.16	314	M	27,000 GPD
	Steeleville	5	6S,5W,Sec.16	335	M	47,000 GPD
	Steeleville	6	6S,5W,Sec.16	335	M	36,500 GPD

- H. Discuss the possible effects that this mining operation will have on the above-listed public water supplies and explain what precautions will be taken to prevent an adverse impact from occurring.

See answer to question 2) D. this part.

- I. Locate all private water supplies within 1/2 mile of permit area within the permit area itself.

See Map A

- J. Locate on the hydrologic map existing surface and ground water discharges into underground mines.

None

## PART IV

### OPERATIONS PLAN

#### 1) Proposed Operations Procedures and Methods for the Mine Over Its Projected Life

Describe the type and method of mining procedures and proposed engineering techniques to be employed in the operation of the proposed mine. Describe the major equipment to be employed and how such equipment will be used in the different aspects of the mining operation. Provide an estimation of the annual coal production by tonnage once the mine is at full operational capacity.

The operations procedures and methods for the experimental practice area are outlined in Part VI on the attached proposal entitled "Groundwater quality associated with an above ground slurry disposal system where vegetation is directly established in lieu of soil cover".

#### 2) Mining Operations Plan for the Proposed Permit Area

Describe the proposed mining operations plan for the permit area in terms of the mining sequence, the employment of facilities, establishment and maintenance of erosion control facilities, air pollution control facilities, coal storage, cleaning and loading areas, location and placement of topsoil spoil, coal waste, or other storage facilities.

No additional mining operations or refuse disposal operations are to occur within the experimental practices area.

- A. Describe how each type of overburden (soil horizons, glacial drift and consolidated material) will be handled with regards to different types of mining equipment. What is the estimated pit width \_\_\_\_\_? If toxic materials have been identified as occurring in the overburden, describe how these materials will be handled to insure proper disposal.

See above note.

- B. Locate on the operations map all soil horizon storage areas and/or root medium stockpiles. Identify each storage area as to its content. Describe measures to be employed to prevent or minimize exposure of soil stockpiles to excessive water and wind erosion, unnecessary compaction and contamination by undesirable materials. Describe methods and treatment measures to be used on exposed areas where topsoil has been removed to prevent excess air and water pollution.

See above note.

- 3) Locate all areas where lateral support removal will approach the minimum distance allowed. State the minimum width of lateral support to be left in appropriate areas. Be sure to account for highwall sloping when such slopes are to be incorporated into the proposed reclamation plan.
- 4) Blasting - Blasting will not occur under the auspices of this permit application.

Each application shall contain a blasting plan for the proposed permit area which provides for compliance with requirements of Sections 1816.61-1816.68, including the following:

- A. A copy of the proposed blasting schedule(s) and a list of persons to whom the schedule will be distributed for each blasting area described.
- B. A copy of the format used to notify persons within one-half mile of the permit area as to how to obtain a pre-blast or condition survey.
- C. A brief description of procedures to be used to perform pre-blasting or condition surveys and for distributing copies of owners/residents and the Department.
- D. A copy of the blasting log form.
- E. The anticipated minimum square root scaled distance value to the nearest structure to be protected under Section 1816.65(i) that exists at the start of the operation.
- F. A description or supervisory or other duties of persons responsible for -
  - (1) Blast Design
  - (2) Borehole loading
  - (3) Shot wiring
  - (4) Shot firing and control of the blasting area
  - (5) Air blast and ground vibration control
  - (6) Air blast and ground vibration monitoring and analysis
  - (7) Obtaining and recording required blasting data

- G. A statement that all persons responsible for blast operations are trained, competent, and hold current valid blaster certification issued by the Department.
- H. Description of unavoidable hazardous conditions for which deviation from the blasting schedule will be needed under Section 1816.65(b).

5) Support Facilities - There are no support facilities under the auspices of this permit application.

- A. Locate on a mining operations map each of the areas to be permitted for surface disturbance to facilitate the mining operation. Map shall include all support facilities including buildings, structures, conveyors, parking areas, coal preparation plants, yards, railroad spurs and on site rail yards.
- B. Indicate acreage of each type of facility within permit area such as: buildings, roads, railroad, parking areas, pavements, loading and unloading facilities, and undeveloped areas. (Summation of above areas should equal total support facility area.
- C. For buildings provide:
  - 1. Dimensions including height.
  - 2. Type of construction, i.e. steel frame, wood frame, masonry, concrete, etc.
  - 3. Type of floors, i.e. reinforced concrete, plain concrete, dirt, gravel, etc. For concrete, give thickness.
  - 4. Intended building use.
- D. Transportation facilities
  - 1. On mining operations map or other map show location of:
    - a) Proposed road(s), conveyor system(s), or rail system.
    - b) Related sediment control facilities.
    - c) Earth borrow locations and/or locations for deposition of excess excavation.
  - 2. Provide plan-profiles of existing gradeline, proposed road centerline, and ditch flow lines. Provide typical cross sections where appropriate.
  - 3. Provide construction details for all sediment control facilities to be constructed to prevent additional contributions of suspended solids to streamflow or to runoff outside the permit area.

4. Discuss the revegetation of ditch and borrow areas involved in construction.
  5. Discuss the estimated life of each facility and how materials will be removed when the facility becomes inactive.
- E. For structures other than buildings: Provide dimensions, construction material used and other information necessary to permit an estimate of demolition cost.
  - F. Indicate location and size of buried volatile material storage facilities.
  - G. Area closure or abandonment.
    1. Describe all reclamation efforts to be expended to satisfy the requirements of abandonment. If an exemption request is to be made, it should be included.
      - a) Include the timing to meet the final grading and revegetation requirements.
      - b) Include a description of the final graded slopes, and the type of seed and seeding.
      - c) Explain final coverage or treatment of toxic areas and locate all borrow pits.
- 6) Waste Material - No additional waste material is to be disposed of within the proposed permit area under the auspices of this application.
- A. Identify the nature of all waste material including non-coal waste to be disposed of within the permit area. Give the net neutralization potential.
  - B. Indicate location of all areas in which such materials including non-coal waste are to be disposed of on the mining operations map. Indicate all streams, creeks, and surface water impoundments within such areas or which receive runoff from such areas. Provide acreage of disposal area and borrow areas. Indicate location of borrow area on mining operations map.
  - C. Provide construction details for all impoundments and structures to contain such waste material. Provide typical cross sections of all proposed levees, dams and excavations.
  - D. Indicate location and provide details for diversions as necessary to divert surface water around such areas on the mining operations map.



- E. Provide details of diversion or other devices designed to collect surface runoff from waste disposal sites and transport same to appropriate treatment facility.
- F. Provide details of such treatment facilities and identify points of discharge.
- G. Explain measures to be taken to avoid pollution of surface or ground water due to leaching through levees or dams and through underlying soil for disposal areas.
- H. Explain reclamation plan, including timing of final coverage and restoration planned for all waste disposal areas. Identify location for borrow material to be used for final coverage. Describe the nature and permeability of the cover material.
- I. Describe estimated life of each area.
- J. Coal preparation: Coal processing will not occur in the permit area.
  - 1. Give a general description of the coal processing operation at this facility.
  - 2. Describe the fresh water (makeup) and slurry circuits for this operation and indicate if a discharge occurs. If a discharge does occur, it should be included on Schedule A. If a discharge does not occur, a detailed description of how this will be accomplished must be submitted.
  - 3. What safeguards are provided to prevent the discharge of slurry fines and untreated slurry water during emergency situations, (e.g. power outages, mechanical equipment breakdown, plant shutdowns, etc.)? Also indicate where the slurry would go in the event of an emergency discharge, and the environmental impact this would have.

7) Surface Drainage Control

- A. 1. Locate on the mining operations map or on a separate drainage map all proposed drainage control systems. Show drainage patterns of all affected mining areas.

Please refer to Part V Map C, Slurry Impoundment Site Map.

2. Will all surface drainage from the affected mining area be collected and treated prior to leaving the permit area? Yes X No \_\_\_\_\_. If no, delineate how and where surface drainage will be collected and treated, and list permit numbers and type of permit that the drainage control systems are operated under.

Surface drainage from the experimental practices area is collected and diverted to sediment pond (Fresh Water Lake) BS4-8(001). This sediment pond is located on adjacent permit #849-82 (pending SM-1 application #74). Please refer to application #74 for details regarding design of pond BS4-8(001).

- B. Will all surface drainage from unaffected areas be intercepted and diverted around the affected mining area? Yes X No \_\_\_\_\_. If no, please discuss.
- C. Describe the timing in which all construction of the sediment ponds and surface drainage control structures will be complete. Include a discussion of the vegetation stabilization of these structures.

All sediment and surface drainage control structures are complete and vegetated.

D. Overland Flow Diversions

There are no overland flow diversion within the permit area.

For all diversions of overland flow, shallow ground water flow, and ephemeral streams which divert surface water around the mining area, and all collection drains that transport affected area runoff into water-treatment facilities, provide the following:

1. Typical cross sections showing bottom width, side slopes and depth.
2. Proposed flow line slope.
3. Runoff diversion capacity calculations.
4. Details of proposed erosion and sediment control measures to be employed.

For permanent diversions also include:

1. Watershed limits upstream from the diversion.
2. Plan profile drawings of the proposed diversion showing existing gradeline, proposed diversion bottom gradeline and water surface at design storm.

E. Sedimentation Pond Design:

Please refer to previously submitted SM-1 application #74 for design information on sediment pond BS4-8(001).

- F. 1. Discuss the design basis for the sediment pond(s) calculations.

Refer to Part IV 7) E. above.

2. Submit a typical section of the embankment(s), details of the principal and emergency spillways and a plan view of each pond at a scale of 1 inch = 200 ft. or larger showing pond bottom contours and points of inflow.

See "Sediment Pond Data" sheets.

Refer to Part IV 7) E. above.

- G. If sediment removal becomes necessary, explain how the sediment will be removed, where it will be disposed of, and what disposal methods will be used.

Refer to Part IV 7) E. above.

- H. Will pH adjustment be necessary on any of the discharges in order to meet the applicable State and Federal Standards? Yes \_\_\_\_\_ No X. If yes, include the required information listed in the stream diversion section, Part V.

- I. Will any temporary or permanent diversions of intermittent or perennial streams be constructed in the proposed permit area? Yes \_\_\_\_\_ No X. If yes, include the required information listed in the stream diversion section, Part V.

- J. Permanent and Temporary Impoundments (1816.49).

Will the mining operation involve the construction of any impoundments other than those for waste retention? Yes \_\_\_\_\_ No X. If yes, include the following information.

1. Locate on mining operations map impoundments, dam locations, and watershed limits, indicate which impoundments are proposed to be permanent and must meet requirements of Rule 1816.49(a).

2. Provide construction details of dams, spillways, seepage control measures, and erosion control measures for inlets and outlets. Employ maps and cross sections where necessary. Where design plans for proposed structures are not provided, submit a certification statement providing a schedule for submission of detailed design plans for each structure.

K. If any of the following questions are answered yes, a permit may be needed from Illinois Department of Transportation - Division of Water Resources.

1. Will the mining operation involve the construction of any levees, dikes, haul roads or other similar structures or the placement of any fill along or in the flood plain of any stream serving a drainage area of ten (10) square miles or greater at the point of construction? Yes \_\_\_\_\_ No X.
2. Will the mining operation involve any relocation or diversion of or any construction activity in, over, under or along the banks of any stream serving a drainage area of ten (10) square miles or greater at the point of construction? Yes \_\_\_\_\_ No X.
3. Is there any urban development (residential, commercial or industrial uses) in the areas immediately surrounding the mining operation? Yes \_\_\_\_\_ No X.  
(If yes, please re-answer questions 1 and 2 above applying a one (1) square mile drainage area limit.)
4. Will the mining operation involve the construction, major modification, or removal of any dam which in the event of failure would have probability for loss of life or additional economic loss in excess of that which would occur downstream of the dam in the absence of the dam? Yes \_\_\_\_\_ No X.
5. Will the mining operation involve the construction, major modification, or removal of any dam 25 feet or more in height? Yes \_\_\_\_\_ No X.
6. Will the mining operation involve construction, major modification, or removal of any dam which would have an impounding capacity of 50 acre feet or more? Yes \_\_\_\_\_ No X.

8) Surface Water Monitoring Program

- A. Has a N.P.D.E.S. permit been applied for? Yes X No \_\_\_\_.
- B. 1. Has a N.P.D.E.S. permit been obtained? Yes X No \_\_\_\_.  
If yes, give the permit number, the date issued, the expiration date, and the number of discharge points monitored. If additional discharge points are proposed by this application, list discharge numbers. Locate on the Water Monitoring Map and number all discharge points for the proposed permit area.
- I.E.P.A. Permit No. IL0052795  
Date Issued: December 16, 1982  
Date Expires: August 31, 1985  
Outfalls: (001) through (030)  
Additional requested outfalls (029), (030).
2. In accordance with Rule 602(f) of Chapter 4, is the applicant requesting that monitoring and reporting be on the basis of grab samples? Yes X No \_\_\_\_.

- C. Are N.P.D.E.S. reports to be submitted to satisfy the reporting requirements? Yes X No \_\_\_\_\_. If not, submit a proposed monitoring and reporting program. Discharge information sheet is given in Schedule A. Schedule A should be completed for all proposed discharge points. An estimate of the expected discharge concentration for each listed parameter must be indicated (or marked N/A) and a basis for that estimation provided.

Schedule A is completed for the proposed discharge point. Expected discharge concentration levels for proposed outfalls are based on typical concentration levels from existing outfalls at the mine (based on previous NPDES sampling or analysis work completed under the Consolidated Permits Program).

If ammonia is to be utilized in wastewater treatment, indicate the discharge(s) resulting from this treatment and provide an estimate of the expected discharge concentration (mg/l) of ammonia nitrogen (as N) from the discharge(s).

Ammonia will not be utilized in waste water treatment.

- D. Give a brief description of the water sampling and flow measurement equipment which will be used to monitor the discharges.

All methods used for water analysis are approved standard methods per the 14th. Ed. of the Water Pollution Control Federations Standard Method.

Some of the equipment used for sampling includes:

- (1) Varian Atomic Absorbtion Spectrophotometry Unit
- (2) Metler Analytical Balance
- (3) Fisher Drying Unit
- (4) Tetradyne Flow Meter

Groundwater samples will be taken following two procedures recommended by Gibb et al. (1981). Wells with poor production capabilities (transmissivity < 100 gpd/ft) will be pumped until one well volume of water has been removed. The well will be allowed to recharge for a short period of time and then a water sample will be collected from the pump discharge. Wells with better production capabilities will be pumped prior to sampling based on a curve relating % Aquifer Water in the discharge to the length of time pumping continues.

Water samples will be divided into 3 parts in the field.

- 1) Field-filtered (0.45 micrometer membrane filter) to determine Cl, Hardness, Na, TDS and SO<sub>4</sub>.
- 2) Field filtered, acidified (0.45 micrometer membrane filter). Filtrate will be acidified with HNO<sub>3</sub> to a pH of 3.0 or less. The following determinations<sup>3</sup> will be made: Ca, Fe, Mg, Mn and Zn.
- 3) Unfiltered, settled

The following determinations are made on aliquots of the clear supernatant solution: acidity and alkalinity.

pH and Temperature will be determined at each monitoring site. Collection procedures are described in Brown et. al. (1974).

In addition, static water levels will be monitored monthly for the first 6 months and quarterly thereafter. Sample collection will also follow this timetable.

Monitoring wells will be constructed of 4½" I.D. PVC pipe. Approximately 10 feet of screened interval will be installed depending on the well in question. Figure 3 shows a typical well construction diagram. A submersible 4.0" pump will be used to develop the wells and collect water samples. Consolidation Coal Company will replace monitoring wells which are destroyed or become unserviceable during the course of the study.

### Project Duration

In order to adequately quantify the impact on groundwater of aboveground slurry disposal and demonstrate the permanence of the vegetative treatment, it is proposed that this project be implemented for a 10 year period.

A ten year monitoring period will be necessary for the following reasons:

- 1) To allow adequate time for the primary weathering processes to occur.
- 2) To monitor changes in groundwater quality near the site due to the impermeable nature of the earth materials present.
- 3) To define the self sufficiency of the vegetative cover.

- B. Implementing erosion control structures to reduce erosion on post-mining land.
- C. Constructing sediment ponds to contain runoff from effected area.
- D. Minimizing the amount of disturbed area.
- E. Stabilizing the soil through revegetation.
- F. Containing potentially acid producing material in areas that minimize adverse effects on water quality.

## SCHEDULE A

DISCHARGE # *	BS4-8(001)				
QUARTER SECTION	SW				
SECTION	34				
TOWNSHIP	T5S				
RANGE	R4W				
COUNTY	Perry				
AVERAGE FLOW(gpd) if discharge does not result from precipitation	0				
MAX. FLOW(gpd) if discharge does not result from precipitation	0				
SOURCE OF DISCHARGE (e.g. pit pumpage, processing plant circuit surface runoff, etc.)	Surface runoff, belt drainage from prep. plant				
SAMPLING METHOD (24 hr. composite, grab, est., etc.)	Grab				
ACIDITY (mg/l)	-85				
ALKALINITY (mg/l)	92				
LEAD (mg/l)	0.07				
IRON (mg/l)	0.70				
MANGANESE (mg/l)	0.18				
pH (range)	7.2 to 7.5				
ZINC (mg/l)	0.02				
FLOURIDE (mg/l)	0.54				
TOTAL SUSPENDED SOLIDS (mg/l)	32				
SULFATE (mg/l)	314				
TOTAL DISSOLVED SOLIDS (mg/l)	912				
RECEIVING STREAM	Galum Creek				
Tributary to	Beaucoup Creek				
Tributary to	Big Muddy				
Tributary to	Mississippi				

Discharge # should correspond with NPDES discharge number and shall be shown on the mine



9) Ground Water Monitoring

In addition to the groundwater monitoring plan outlined in Part VI, Page 6 of this application, the following groundwater monitoring plan is currently in effect for the Burning Star No. 4 Mine complex.

- A. Describe in detail a proposed monitoring plan that will measure the amount and duration of any changes to the ground water system resulting from the mining operation. Parameters to be monitored are given in Schedule B. Monitoring should be on a quarterly basis with reports due within one month of the end of each quarter as follows:

<u>Quarter</u>	<u>Report Due</u>
January, February, March	May 1
April, May, June	August 1
July, August, September	November 1
October, November, December	February 1

See Experimental Practices Proposal, Part VI.

- B. Provide a drilling log and completion information and/or a diagram of each well proposed as a monitoring well. Suggested diagrams are attached. Monitoring information is given in Schedule B.

See Experimental Practices Proposal, Part VI.

- C. Locate wells and springs, on or within 1/2 mile of the mining area on a hydrologic map. If any of these wells are to be employed for monitoring, designate on hydrologic map and complete Schedule B.

Please refer to Map A, U.S.G.S. Topographic Map, for location of wells.

- D. Discuss any reported problems of maintenance, or ground water quantity or quality which have occurred at the wells and springs listed above.

None.

- E. Will this operation have any discharges to, or pump water from abandoned underground mines? Yes \_\_\_\_\_ No X. If yes, submit a detailed discussion.

8" CONCRETE COVER  
WITH FLUSH LID

GROUND SURFACE

8'-8" SURFACE  
CASING

TO PRESSURE TANK

MONITORING WELL No. MW-40-1

LOCATION NE1/4, NE1/4, NE1/4, SEC. 4,

T6S, R4W

CLAY

22.0' ELEV. 490 (EST. FROM TOPO MAP)

RED, GRAY, BROWN SHALE

58.0' LIMESTONE

72.0' SHALE & COAL

81.0' SHALE WITH 2' LIMESTONE

118.0' COAL - NO. 6

123.5' SHALE AND LIMESTONE

144.6' COAL - NO. 5 (2.0')

SHALE

224.0' COAL - NO. 4 (1.5')

SHALE WITH 2' LIMESTONE

269.0' COAL - NO. 2A (1.0')

SHALE AND SANDY SHALE

353.0' LIMESTONE (2.0')

SHALE

PRODUCTION DATA: N/A

404'

407'

424.0' SAND-  
STONE  
OPEN HOLE (?)  
SHALE

450'

SANDSTONE

533' BOTTOM OF HOLE

65/8" O.D. 19LB. STEEL  
CASING

PRESSURE CEMENTED

BORE HOLE OF  
UNKNOWN DIAMETER

SUBMERSIBLE PUMP SET AT  
UNKNOWN DEPTH

WELL INSIDE WAREHOUSE  
BUILDING

WELL DESIGNATED FOR  
QUALITY DATA ONLY

WATER FROM  
SANDSTONE - 450-533 "  
(DRILLER'S RECORD PERMIT  
NO. 17274)

DATE	STAT. LEV. FT.	PUMP. LEV. FT.	PUMP RATE GPM	SPEC. CAPAC.

Owner CONSOLIDATION COAL COMPANY

Address P.O. BOX 218 PINCKNEYVILLE, IL 62274

(MINE SUPPLY WELL)

GROUNDWATER MONITORING  
WELL CONSTRUCTION DIAGRAM

BURNING STAR NO. 4 MINE

DATE: 8-26-80 SCALE: 1" = 63'

Designated # (shown on map)	MW-4D-1		
Ownership: Name Address	Consolidation Coal Company P.O. Box 218 Pinckneyville, IL 62274		
Distance from mining area (ft)	1300		
Ground elevation (MSL)	485		
Normal water elevation (MSL)	NA		
Total depth of well (ft)	533		
Water bearing strata	Sandstone		
Type and size of casing	6 5/8" Steel		
Type and capacity of pump	NA		
Pumping rate (gpm)/ drawdown (ft)	NA NA		
Type of pipe	NA		
Point of sampling	Grab at Faucet		
Water Quality: Averages from Table 11 Part 7, §10.			
Calcium (mg/l)	38		
Iron (mg/l)	0.7		
Magnesium (mg/l)	1.3		
Manganese (mg/l)	0.2		
Sodium (mg/l)	180		
Zinc (mg/l)	0.05		
Chloride (mg/l)	69		
Fluoride (mg/l)	0.2		
Nitrate (mg/l)	58		
Sulfate (mg/l)	40		
Acidity (mg/l)	0		
Alkalinity (mg/l)	338		
Total hardness (mg/l as CaCO <sub>3</sub> )	130		
Total dissolved solids (ROE)	500		
Conductivity	871		
Field pH	8.4		
Field temperature (°F)	19		

10. Provide a description of each existing structure proposed to be used in connection with the proposed mining operation with the following provided at a minimum: location, indicated on the mining operations map, a description of its current condition, approximate dates when construction was begun and completed, and a showing that the structure meets the applicable performance standards. If an existing structure is to be modified for use in the mining operation, a compliance plan for each structure must be provided meeting the requirements of Section 1780.12(b) of the Illinois Regulations.

Freshwater Lake BS4-8(001)

The Freshwater Lake was constructed prior to 1977 and is in good condition. Since it provides makeup water for the preparation plant, it does not discharge on a frequent basis. For 1982, the pond has been checked for discharges twenty-five times. Only on four occasions was it found to be discharging and all four samples were within effluent limits (100 percent compliance).

PART V

RECLAMATION PLAN

1. Provide a general, narrative statement outlining proposed reclamation of the lands within the proposed permit area. The narration should include proposed post-mining land uses and the proposed uses for any structures or facilities which are proposed to remain, the contour or grade proposed for the reclaimed area, the proposed revegetation by vegetation type, and the general timetable for completion of the proposed reclamation.

Wildlife habitat is the post mining land use for the experimental practices area. Details regarding the contour of the land and the vegetation plan are outlined in the experimental practices proposal in Part VI of this application.

2. Reclamation Plan: General Requirements and Information

Post Mining Land use.

- A. Provide a detailed description of proposed post-mining land uses employing the land use categories listed below. Provide acreage figures for each post-mining land use proposed and designate the post-mining land uses on the Post-mining Land Use Map.

Please refer to Map E, Land Reclamation Plan.

Land Uses

Cropland	
Pasture Land	
Grazing Land	
Forestry	
Residential	
Industrial, Commercial	
Recreation	
Fish and Wildlife Habitat	72 Acres
Developed Water Resources	
Undeveloped Land	

- B. Provide a description of how the proposed post-mining land uses are to be achieved, and describe any necessary support activities which will be needed to achieve the proposed land uses. Discuss the utility and capability of the reclaimed lands to support a variety of alternative uses and the relationship of the proposed uses to existing land use policies and plans. Provide a copy of the comments concerning the proposed land use by the owner of the surface of the proposed permit area and by the State or local government agencies which would have to initiate, implement, approve or authorize the proposed uses of the land following reclamation.

Upon completion of the reclamation requirements, the reclaimed land will be managed by Consol during the bond liability period.

Wildlife habitat will be re-established through herbaceous and woody plantings. These plantings will be designed to maximize edge and to provide travel corridors through reclaimed areas. Species and rates of planting are listed below in Part V) 6) c.

There are no state or local government which would have to initiate, implement, approve or authorize the proposed uses of the land following reclamation.

Various government agencies at all levels will have the opportunity to review and comment on the permit application during the period afforded through the Surface Coal Mining Land Conservation and Reclamation Act Rules and Regulations Part 1786.12.

3. Where a post-mining land use different from a premining land use is proposed, provide information required to obtain approval in accordance with Section 1817.133.

Mining is not to occur in the permit area and the land use will not change under the experimental practices procedures.

4. High Capability Lands

Are there any lands in the proposed permit area to be reclaimed to high capability land standards? Yes \_\_\_\_\_ No X . If yes, include applicable discussions.

There are no high capability lands within the permit area.

- A. Locate on the post-mining map the location of the replaced high capability land. Give acreage totals.
- B. Discuss how wind and water erosion will be minimized. Include discussions of construction, timing, seeding, seeding equipment to be used and erosion control structures to be used.
- C. Discuss the management of these areas including crop rotations, green manuring, and levels of fertility.
- D. Discuss the timing of the construction and removal of the erosion control structures. If sediment ponds are proposed to be left to hold future sediment loss of cropland areas, describe long term maintenance plan.

- E. Discuss the final graded slopes of the replaced high capability areas. Include a discussion of slope lengths.
- F. Discuss the replacement of soil horizons with respect to horizon thickness and total root zone.
- G. Discuss the methods of mulching to be used with respect to seasonal variation.

5. Backfilling and Grading

- A. 1. Describe how approximate original contour will be achieved. Discuss method employed for overburden removal, spoil placement, and grading, including the removal and redistribution.

Overburden removal, spoil placement and grading will not occur within the experimental practices proposed permit area.

- 2. Indicate whether or not the volume of all available spoil and suitable waste material is sufficient or more than sufficient to achieve the approximate original contour (Thin Overburden - 1816.104 and Thick Overburden - 1816.105). Provide sufficient contour maps and cross sections to show the anticipated final surface configuration of the proposed permit area.

Please refer to Part VI, Page 8 of the application for a typical cross section of the refuse pond.

- B. Describe all water and erosion control structures to be constructed in areas other than those reclaimed to the standards of high capability lands and prime farmlands.

Erosion has been controlled by a permanent vegetative cover.

- C. Describe the timing in which all grading and the construction and removal of water and erosion control structures will be complete and the sequence for accomplishing the work in relation to seasonal weather conditions.

All grading and construction activities as well as erosion control structures are complete. No significant additional disturbances are to occur.

6. Revegetation

- A. Describe the species, timing and rates of seeding of all areas. Include the type of equipment to be used for seeding and seedbed preparation. If an introduced species is proposed, indicate type and area to be planted.

Please refer to Part VI, Page 4 and 5 of this application for vegetation details.

- B. Are areas to be temporarily seeded and/or mulched to control erosion? Yes \_\_\_\_\_ No X. If no explain. If yes, describe in similar fashion to A above. Include rates and types of mulch.

Temporary seeding and/or mulching to control erosion is not expected to be necessary. No new significant disturbances are to occur.

- C. If woodland and/or wildlife habitat planting are proposed, submit the planned species and density of tree and herbaceous cover to be seeded and planted.

Please refer to Part VI, Page 4 and 5 of this application for details of wildlife habitat plantings.

- D. Describe and locate the vegetative reference area and the plan for maintaining appropriate management of these areas for the purposes of measuring ground cover, productivity and species density. If an alternate plan is proposed to measure productivity in lieu of the reference area, describe plan in detail.

Success of reclamation and vegetation shall be assessed in accordance with guidelines for the comparison of the restored area to reference area or other techniques for measurement of productivity (which consider local rainfall amounts, soil types, required levels of management, etc.) as adopted by the Regulatory Authority at the time of demonstration of productivity or ground cover.

- E. If any of the post-mining land uses are to include industrial or residential uses, describe revegetation measures to control erosion.

No industrial or residential post-mining land uses are proposed.

- F. Are there any plans to use nurse crops or crop rotations to improve future row crop productivity? Yes \_\_\_\_\_ No X. If yes, describe type, duration and management of these areas.



- G. Describe soil testing plan for evaluation of soil nutrients and amendments necessary for revegetation.

The following analyses will be done on each composite sample:

pH - pHw 1:1  
Phosphorus - Bray P-1  
Potassium - Ammonium Acetate Extraction  
(atomic absorption)

Each area will be sampled on its own merit and recommendations for nutrient amendments will be made accordingly.

Any alterations of the above stated sampling frequency and soil testing parameters, and analyses will be made at the discretion of our soil scientist, agronomist or farm manager.

Please refer to Part VI page 6 for additional discussion.

7. Describe measures to be employed to maximize the use and conservation of the coal resources.

As stated in the experimental practices proposal, by not covering the slurry refuse that "When secondary recovery of these refuse materials becomes economically feasible, costly removal of replaced soil materials would not be necessary." There would also be no slurry material lost through contamination by soil materials.

8. Describe measures to be employed to insure that all debris, acid-forming and toxic-forming materials, and materials constituting a fire hazard are disposed of in accordance with 1816.89 and 1916.103. Provide a description of the contingency plans which have been developed to preclude sustained combustion of such materials.

There are no acid forming or toxic forming substances or any other debris or additional waste to be disposed of within the permit area.

A permanent stand of vegetation will be used to ensure stabilization of the experimental practices area.

9. Describe the measures to be used to seal or manage mine openings, and to plug, case, or manage exploration holes, other bore holes, wells, and other openings within the proposed permit area.

Bore holes will be sealed by backfilling the hole with natural materials removed during the drilling operations. The only boreholes or openings to be cased will be those drilled for the purpose of groundwater monitoring. Please refer to monitoring well diagram, Part IV, 9) herein for casing details.

## 10. Protection of Hydrologic Balance

The answer to this question has two basic parts. The first part deals with measures to be taken to protect 1) the quality of surface and groundwater systems, 2) the rights of present users of surface and groundwater and 3) the quantity of surface and groundwater or to provide alternative sources of water where the protection of quantity cannot be ensured. The second part contains the evidence that these measures are effective, in the form of a determination of the probable hydrologic consequences of the proposed surface mining activities.

### I. Control and/or Treatment of Surface and Groundwater Drainage.

1. Consolidation Coal Company intends to comply with the I.E.A.P. "Code of Good Operation Practices" by:
  - A. Intercepting and diverting unaffected surface runoff.
  - B. Implementing erosion control structures to reduce erosion on post-mining land.
  - C. Constructing sediment ponds to contain runoff from effected area.
  - D. Minimizing the amount of disturbed area.
  - E. Stabilizing the soil through revegetation.
  - F. Containing potentially acid producing material in areas that minimize adverse effected on water quality.

2. The rights of present users of surface and ground water; and

Consolidation Coal Company will replace the water supply of an owner of interest in real property who obtains all or part of his or her supply of water for domestic, agricultural, industrial, or other legitimate use from an underground or surface source, where the water supply has been affected by contamination, diminution, or interruption resulting from the Company's surface mining activities.

3. The quantity of surface and ground water or to proved alternative sources of water where the protection of quantity can not be ensured.

Studies performed on surface mined lands with regard to water (both surface and groundwater) indicate substantial increases in quantities. In a preliminary evaluation of twelve (12) final cut lakes in Illinois, authors Gibb and Evans, 1978 indicate that for "Knox and Perry Counties, the final cut impoundments offer the largest single estimated resource. For 10 counties (Bureau, Fulton, Jackson, Knox, Perry, Randolph, Saline, Schuyler, Stark and Williamson) the estimated yield potential from final cut impoundments exceeds the estimated 2020 water demands". Furthermore, in addition to water available in mine lakes, the mining process increases the permeability of lands previously groundwater poor. Mine lands typically exhibit greater infiltration rates and higher than normal groundwater tables which is further evidence of greater water yield potentials.

All drainage leaving the affected mine areas will be passed through a sedimentation pond. Drainage leaving the impoundment (via decant) is ditched to the freshwater lake BS4-8(001). This lake supplies make-up water to the preparation plant but does discharge occasionally.

Consolidation Coal Company proposes to meet quantitative limits on pollutants in discharge according to the limits in NPDES permit requirements. General requirements are shown below but it is possible that other parameters will be required based on NPDES review of water quality data at the site.

#### Effluent Limitations and Monitoring

Parameter	Load Limits (lbs/day)		Concentration Limits (mg/l)		Sample Freq.	Sample Type
	30 Day Ave.	Daily Max.	30 Day Ave.	Daily Max.		
Flow						Measure when Monitor
TSS			35.0	70.0	1/mo.	Comp.
Iron (total)			3.0	6.0	1/mo.	Comp.
pH	6.0	pH 9.0			1/mo.	Grab
Alk/Acidity	Total Acidity shall not exceed total alkalinity				1/mo.	Grab

## II. Probable Hydrologic Consequences

### Location and Climate

The proposed permit area at Consolidation Coal Company's Burning Star No. 4 Mine lies within T5S R4W of Perry County and encompasses most of Section 34. The permit area is within the Galum Creek watershed. Galum Creek has a drainage area of 163 sq. mi. (Flemal, 1981). The Galum Creek watershed has been heavily effected by mining in the past from Highway 154 to the north to the confluence of Galum Creek with Beaucoup Creek (GERPDC, 1978).

The mean annual precipitation is between 41 and 42 inches (Zuehls et al., 1981). The distribution of rainfall during cold and warm halves of the year are nearly equal (Zuehls et al., 1981). In the warm season, thunderstorms account for over 70% of the precipitation (Zuehls et al., 1981). The mean annual temperature, during the period 1941-1970, at Carbondale was 57.0°F (U.S. Dept. Commerce, 1973).

Other climatic conditions from Atlas of Illinois Resources (1958) follow. Mean annual runoff is 10-15 inches. In southern Illinois the period May to mid September is usually one of withdrawal of water from storage as groundwater and soil moisture. Water passes into storage during spring and fall periods when evaporation and transpiration rates are low. Also in this area the lowest annual precipitation expected once every 50 years is 26-28 inches. The highest annual precipitation expected once every 50 years is 60-62 inches.

### Water Use

In the southern Illinois area near B.S. No. 4 mine the vast majority of water withdrawals are from surface water sources (Zuehls et al., 1981). Groundwater withdrawals in the area covered by Hydrology of Area 35 (Zuehls et al., 1981) accounted for 13% of the 170 million gallons per day total in 1978. Larger communities use surface-water impoundments for their water supplies. Groundwater is used mainly for rural domestic supplies and small industries (Zuehls et al., 1981, Csallany, 1966).

Several small communities (Steeleville, Percy, Cutler, Campbell Hill and Ava) near the intersection of Randolph, Perry and Jackson Counties obtain water supplies from deep Pennsylvanian and Mississippian sandstones (total depth 350-550 feet) (ISWS, 1983, Private Comm.) Total pumpage in 1981 for Steeleville, Percy and Cutler was 341,500 gallons per day (ISWS, 1983, Private Comm).

### Geology and Hydrogeology

The slurry impoundment is underlain by 15-35 feet of unconsolidated sediments. Geologic Cross Section No. 3 (east-west) indicates the area of thicker glacial sediments is coincident with a shallow (approx. 20 feet deep) valley in bedrock, leading north from the site to the temporary Galum Creek diversion channel. Nine soil borings in the North Field mining area (Map A ) determined that 4 to 10 feet of Wisconsin loess is at the surface. This material is classed as a silty clay loam (approximately 15% sand, 50% silt, 35% clay). Beneath the loess is Illinoian Stage till, typically with a loam texture (approximately 35% sand, 36% silt, 27% clay). Generally hydraulic conductivities of these materials in southern Illinois would be  $10^{-6}$  to  $10^{-5}$  m/s (Walton, 1965 and Freeze and Cherry, 1979). Specific data on water transmitting properties will be obtained as part of the Experimental Practices Proposal. Table 1 in Part III gives estimated hydraulic conductivities of glacial material obtained from monitoring and private wells near Burning Star No. 4. They are in the range  $10^{-6}$  to  $10^{-7}$  m/s.

The bedrock surface near the site is gently undulating moving east-west and seems to have a steady, gentle, downward slope, south to north from T6S, R3W Secs. 3 and 4 to the Galum Creek temporary diversion channel (Geologic Cross Sections 3 and 4). The Herrin (No.6) Coal and Pennsylvanian strata over it also appear to be gently undulating. Consequently, a variety of bedrock strata may form the bedrock surface depending upon the extent of erosion on the Pennsylvanian surface. These strata are not known to have well developed joints, solution cavities or bedding planes which would transmit water. Therefore, the bedrock surface is considered an impermeable barrier.

## Hydrologic Monitoring

### Stream Sampling

1981 data from a site upstream of mining activity on Galum Creek (4G-1) and a site downstream of present mining activity (4G-3) are presented in tables 1 and 2. Collection of samples continues but recent diversion of Galum Creek in the North Field may have resulted in less than representative sampling. The 1981 data were considered more typical.

### Groundwater Sampling

Groundwater monitoring has been conducted in unconsolidated material around the Burning Star no. 4 Mine with three wells representative of conditions near the North Field mining area (MW-4-3, MW-4-4 and MW-4-5). Construction diagrams for these three wells are included in this section and their locations are shown on the Hydrologic Map. Water quality data for the most recent mine quarters of sampling are presented in tables 3-5. Note that field filtering before acidification of samples used for metals determinations was begun in the third quarter of 1982. Summary data on metals do not include previous samplings (tables 6, 7, 8).

## Summary of Data/Predictions

### Surface Water

It is important to note the general water quality conditions in the Big Muddy River basin of which Galum Creek is a part. Flemal (1981) has reported that the Big Muddy basin regularly has levels of Fe and Mn greater than Illinois Pollution Control Board General Use Standards (1.0 mg/l for both). Natural background was believed to be a primary cause. Iron and Manganese have a tendency to form gels and sols once they enter the stream environments. Some of this material clings to stream banks and beds and is eventually flushed during high flow events. Flemal (1981) also indicated that surface water reservoirs were effective in reducing Fe and probably Mn levels through settling.

Flemal (1981) found  $SO_4$  and TDS levels were approximately twice the statewide median levels in the Big Muddy River basin. Coal mining, past and present, were believed to contribute significantly to those levels.

A suspended sediment problem was identified throughout the Big Muddy River basin by Flemal (1981). Agricultural activity and the erosion of stream banks and beds were believed to be the cause (Flemal, 1981)

TABLE 3

CONSOLIDATION COAL COMPANY  
MIDWESTERN REGION  
WATER QUALITY DATA

WELL NO: MW-4-3

MINE: D.S. #11

LAB: D.Q.C. - II.

TYPE OF PIPE: 1" PVC

SAMPLING DATE/TIME (COLLECT.)	SAMPLING POINT Well Volume (Gal)	WATER LEVEL (FT. BELOW G.L.)	ANALYSIS DATE OR DATE REPORTED	Ca (mg/l)	Fe (mg/l)	Mg (mg/l)	Mn (mg/l)	Na (mg/l)	Zn (mg/l)	Cl (mg/l)	Fl (mg/l)	NO <sub>3</sub> (mg/l)	SO <sub>4</sub> (mg/l)	ACIDITY (mg/l)	ALKALIN. (mg/l CaCO <sub>3</sub> )	TOTAL HARDNESS (mg/l as CaCO <sub>3</sub> from Ca+Mg)	T.D.S. (P.P.M.)	GAL. PUMPED BEFORE SAMPLE	CONDUCT (u mhos/cm)	FIELD pH	FIELD TEMP. °C
6-5-81 8:53A	8	17.8	6-5-81	85	3.45	37.8	1.86	83.6	0.09	44	0.13	8	300	-408	416	820	166.4	24	1600	7.3	14
8-25-81 2:20 P	7	19.5	9-4-81	182.6	4.01	93.5	1.19	82.8	0.10	52	0.15	3.44	512	-404	414	1000	1417	21	1700	6.8	14
11-3-81 9:24A	8	17.8	11-5-81	171.4	3.39	98.1	1.43	71.1	0.07	34	0.19	0.1	530	-386	406	831.8	1472	24	1600	7.0	15
3-3-82 11:20	11	13.9	3-5-82	194	7.99	104.5	1.72	81	0.09	28	*	3.7	400	-384	398	914.5	677	35	1600	6.6	13
5-20-82 3:15		16	5-2-82	197.9	23.9	464.6	2.0	86.7	.15	36	.28	34	600	-376	390	2406.4	1289	27	1600	6.9	12
8-19-82 3:00		20.2	8-24-82	170.9	.10	108.1	.67	106.4	.04	30	.32	47	360	-404	424	871.6	1879	10	2200	6.8	16
10-28-82 11:24		19.2	10-29-82	120	1.2	86	0.87	100	0.07	28	0.2	40	550	384	406	650	1580	11	1800	7.0	15
3-24-83 11:14 A		13.8	3-29-83	180	1.4	99	1.2	55	0.04	24	0.4	*	680	0	404	860	1460	21	1700	7.1	14
6-14-83 3:02		16.3	6-17-83	181.6	.36	105.2	.34	171.9	.05	62	.47	1.2	10	0	468	886.5	1916	17	2200	7.0	15
8-1-83	= Unable to test		due to equipment problems																		
	= Result Suspect																				

TABLE 4

CONSOLIDATION COAL COMPANY  
MIDWESTERN REGION  
WATER QUALITY DATA

WELL NO: MW- 11-11				MINE: B.S. #11				LAB: E.Q.C. - II										TYPE OF PIPE: 1" PVC			
SAMPLING DATE/TIME (COLLECT)	SAMPLING POINT Well Volume (Gal)	WATER LEVEL (FT. BELOW G.L.)	ANALYSIS DATE OR DATE REPORTED	Ca (mg/l)	Fe (mg/l)	Mg (mg/l)	Mn (mg/l)	Na (mg/l)	Zn (mg/l)	Cl (mg/l)	Fl (mg/l)	NO <sub>3</sub> (mg/l)	SO <sub>4</sub> (mg/l)	ACIDITY (mg/l)	ALKALIN. (mg/l as CaCO <sub>3</sub> )	TOTAL HARDNESS (mg/l as Ca CO <sub>3</sub> from Ca+Mg)	T.D.S. (R.O.E.)	GAL. PUMPED BEFORE SAMPLE	CONDUCT (u mhos/cm)	FIELD pH	FIELD TEMP. °C
6-5-81 9:43A	7	5.0	6-5-81	112	1.58	50	0.04	83	0.04	34	0.12	*	440	-336	346	960	1712	23	1700	7.3	16
8-26-81 11:40 A	4	8.7	8-4-81	300.1	1.66	66.4	<0.01	92.3	0.10	44	0.23	4.3	560	-328	339	720	1697	12	2100	6.9	17
11-5-81 9:07a	3	9.8	11-5-81	226	1.69	56.3	0.12	83.8	0.17	56	0.13	<0.1	580	-296	294	796	1638	9	1700	7.2	15
3-26-82 10:20	6	4.1	3-26-82	294.8	1.4	92.5	0.45	109.1	0.23	20	0.14	21	650	-342	354	1116.8	1769	12	1400	6.6	9
6-9-82 9:55		5.2	6-11-82	311	1.59	98.3	.20	311	.39	30	.12	25	640	-382	398	1181.2	1980	21	2000	6.7	15
8-19-82 1:45		9.4	8-24-82	118.5	.13	36.7	.07	67	.05	18	.26	64	275	-380	402	446.9	1304	5	1500	6.3	19
10-28-82 10:57		9.4	10-29-82	140	0.2	52	0.35	91	0.04	20	0.2	28	600	324	342	580	1540	4	1700	7.2	17
3-24-83 12:15		3.9	3-29-83	100	1.4	16	0.01	140	0.05	20	0.4	*	480	0	354	330	1090	10	1300	6.8	11
* = Unable to test due to equipment problems.																					
6-14-83 3:55		5.9	6-17-83	106	.43	30.8	.11	71.4	.06	20	.44	1.2	240	0	272	391.5	759	7	900	7.2	14



TABLE 5

CONSOLIDATION COAL COMPANY  
MIDWESTERN REGION  
WATER QUALITY DATA

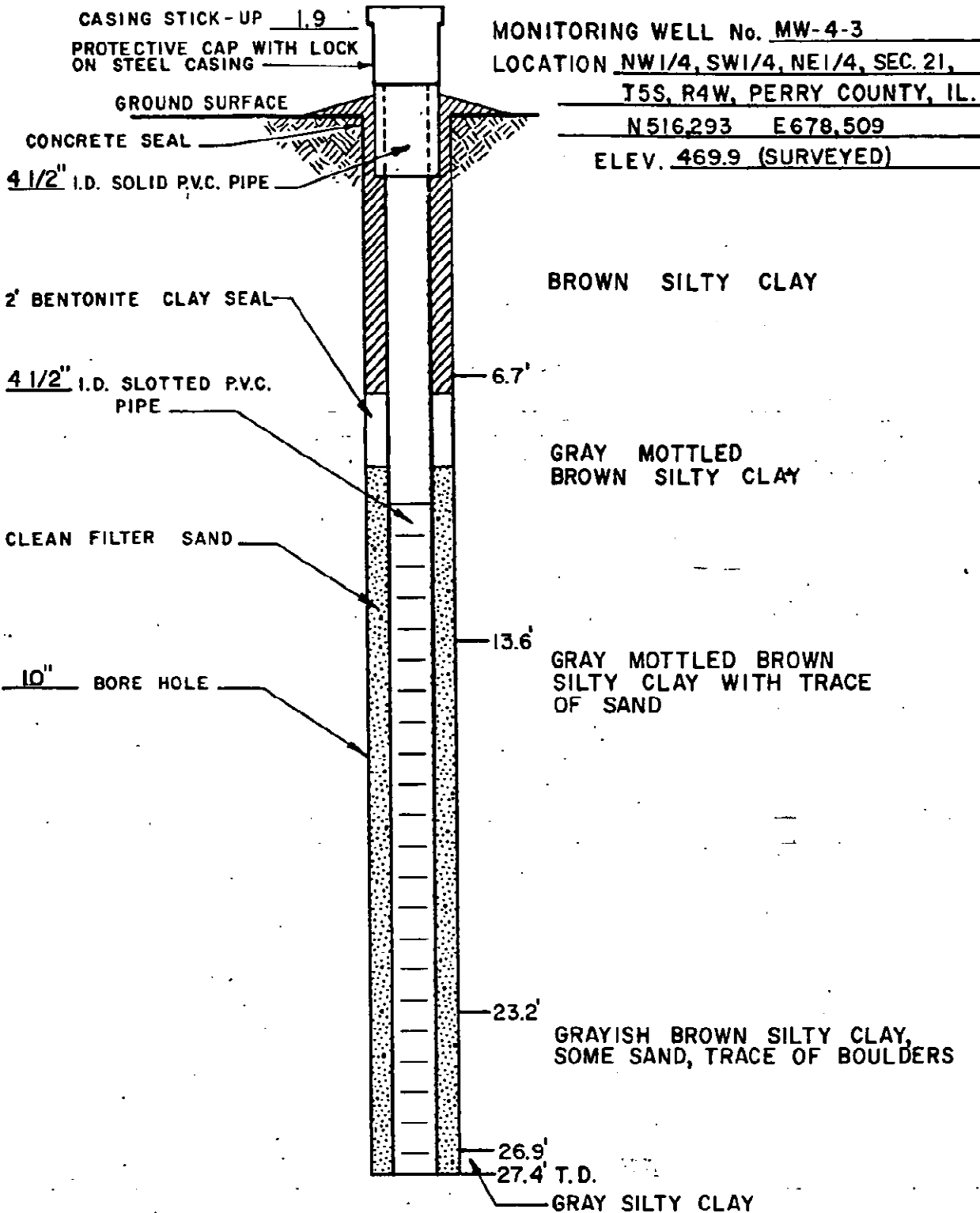
WELL NO. BW-4-5

MINE B.S. #11

LAB. E.Q.C. - II

TYPE OF PIPE 1" PVC

SAMPLING DATE/TIME (COLLECT)	SAMPLING POINT Well Volume (Gnl)	WATER LEVEL (Ft. BELOW G.L.)	ANALYSIS DATE OR DATE REPORTED	Ca (mg/l)	Fe (mg/l)	Mg (mg/l)	Mn (mg/l)	Na (mg/l)	Zn (mg/l)	Cl (mg/l)	Fl (mg/l)	NO <sub>3</sub> (mg/l)	SO <sub>4</sub> (mg/l)	ACIDITY (mg/l)	ALKALIN. (mg/l CaCO <sub>3</sub> )	TOTAL HARDNESS (mg/l as CaCO <sub>3</sub> from Ca+Mg)	T.D.S. (P.P.M.)	GAL. PUMPED BEFORE SAMPLE	CONDUCT. (u mhos/cm)	FIELD pH	FIELD TEMP. °C
6-2-81 10:35A	64	1.7	6-2-81	81.7	0.75	14.3	<0.01	100.6	0.12	34	0.24	3.2	100	-326	334	220	544	200	1000	7.6	15
8-7-81 10:55A	63	2.6	8-7-81	31.8	2.57	12.9	<0.01	148.7	0.02	34	0.26	*	132	-334	344	200	569	200	1100	7.7	17
11-3-81 9:15A	62	3.4	11-5-81	24.0	0.71	13.4	0.04	158.4	0.09	15	0.35	0.64	120	-334	342	116.6	574	200	900	7.0	16
2-23-82 2:30P	64	1.7	2-26-82	94.9	52.2	309.4	1.8	128.1	0.04	20	*	13	75	-350	362	1510.5	1163	192	400	7.4	14
5-20-82 2:55		2.9	6-2-82	154.9	62.2	23.3	2.9	154.8	.12	32	.42	64	140	-354	372	482.7	536	200	900	7.2	14
8-19-82 2:15		4.5	8-24-82	36	.41	14.7	.20	161.4	.01	20	.42	100	90	-348	368	150.3	617	160	900	6.5	14
10-28-82 11:54		5.2	10-29-82	42	2.1	16	0.18	160	0.05	18	0.3	64	180	356	382	170	659	160	900	7.4	15
	* = Unable to test due to equipment problems.																				
3-24-83 11:43 P		1.4	3-29-83	210	1.5	46	0.01	43	0.08	54	0.6	*	140	0	358	700	590	150	900	7.1	14
6-14-83 2:30		3.0	6-17-83	55.3	.60	16.2	.15	154.6	.03	20	.60	3.0	18	0	390	204.8	499	153	1000	7.3	14



## Production Data:

Date	3-80			
Static Level-ft.	16.0			
Pumping Level-ft.	20.0			
Pumping Rate-gpm	0.6			
Specific Capacity	.15			

Owner CONSOLIDATION COAL CO.Address P.O. BOX 218PINCKNEYVILLE, IL. 62274GROUNDWATER MONITORING  
WELL CONSTRUCTION DIAGRAM  
BURNING STAR No. 4 MINEDATE: 9-2-80SCALE: 1" = 4'

CASING STICK-UP 2.0  
 PROTECTIVE CAP WITH LOCK  
 ON STEEL CASING

MONITORING WELL No. MW-4-4

LOCATION SE1/4, SW1/4, NE1/4, SEC.34

T-5-S R-4-W N504,408 E685,003

PERRY COUNTY, IL

ELEV. 435.6 (SURVEYED)

GROUND SURFACE

8' CONCRETE SEAL

4-1/2" I.D. SOLID P.V.C. PIPE

BROWN CLAY

10" BORE HOLE

BENTONITE CLAY SEAL

FILTER SAND

4-1/2" I.D. SLOTTED  
P.V.C. PIPE

13.7

LIMESTONE

13.8

BOTTOM OF HOLE

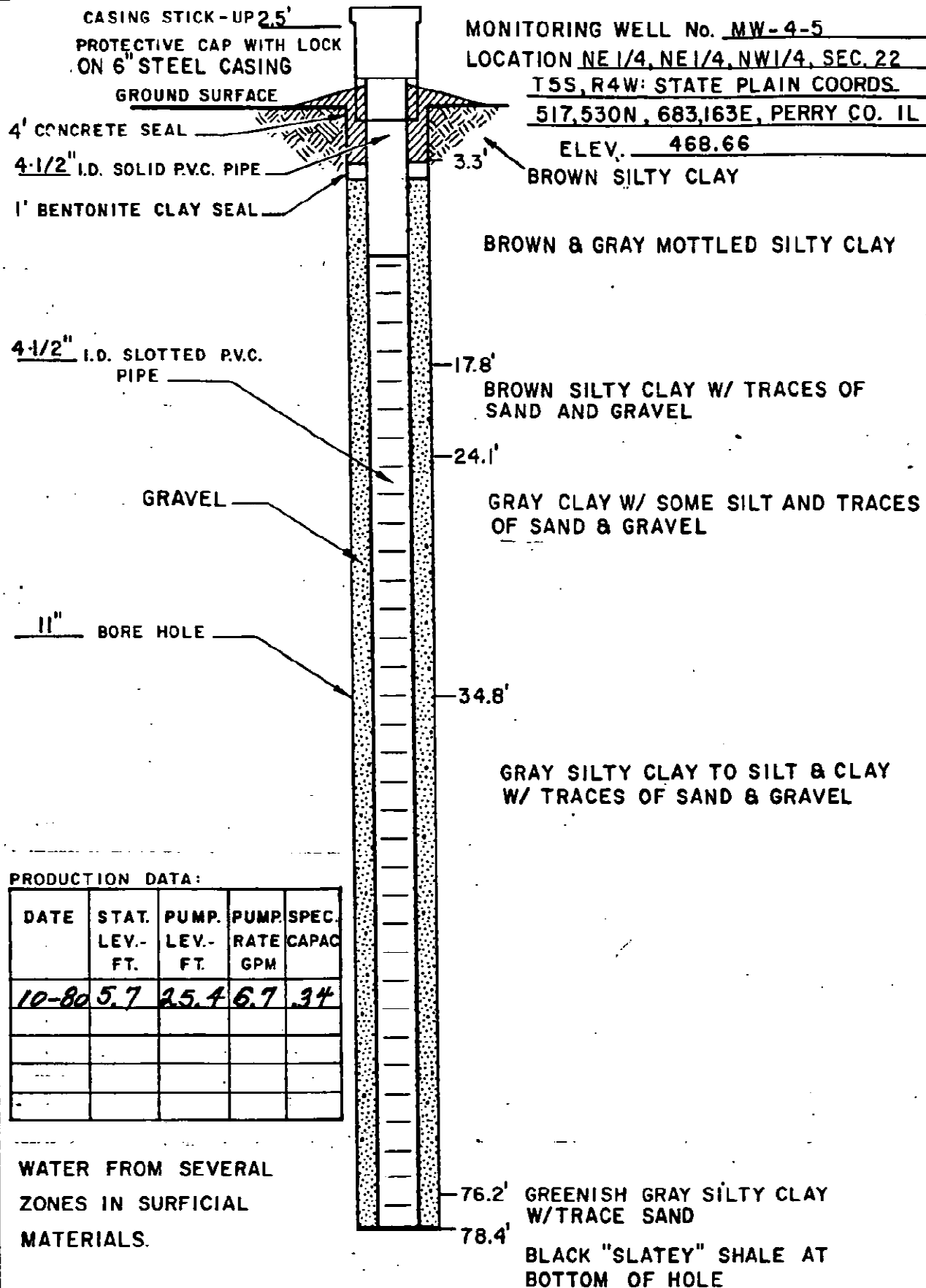
## PRODUCTION DATA:

DATE	STAT. LEV. FT.	PUMP. LEV. FT.	PUMP RATE GPM	SPEC. CAPAC
3-80	3.7	TOTAL DEMAND	.25	N.D.

Owner CONSOLIDATION COAL CO.Address P.O. BOX 218PINCKNEYVILLE, IL 62274

GROUNDWATER MONITORING  
 WELL CONSTRUCTION DIAGRAM  
 BURNING STAR No. 4 MINE

DATE: 3-19-80 SCALE: 1" = 2'

Owner CONSOLIDATION COAL CO.Address P.O. BOX 218PINCKNEYVILLE, IL 62274

**ATTACHMENT VI**  
**WELL CONSTRUCTION DIAGRAM**  
**BURNING STAR No. 4 MINE**

DATE: 9-26-80 SCALE: 1"=10'

No problems with heavy metals were found within the Big Muddy River basin. Their solubility appears to be limited by pH and redox potential, conditions.

Consolidation Coal Company data shown in tables 1 and 2 show that Galum Creek water is near neutral to slightly alkaline. Total Dissolved Solids levels are increased downstream of mining and TSS appears to be increased also. Reclamation activities at the South Field of Burning Star No. 4 Mine will eventually have a beneficial effect on this. Total Iron results at 4G-1 reflect the high natural levels found and do indicate a trend to higher levels with increasing flow. Manganese, lead and zinc are consistently below General Use Standards of 1.0, 0.1 and 1.0 ppm respectively, at both 4G-1 and 4G-3.

Future water quality in Galum Creek was expected to degrade in terms of  $SO_4$  and TDS concentrations per a 1978 study commissioned by the Greater Egypt Regional Planning and Development Commission. The study was to predict impacts of coal mining and reclamation on water quality within the Big Muddy and Saline River basins. The same study estimated that half of the sulfate production would be eliminated within one year of completed reclamation while the balance would diminish to background levels over a 20 year period.

Effects of non-coverage of this slurry impoundment on current and future quality Galum Creek is believed to be minimal. First of all runoff from this small area (via decant) will be a negligible portion of stream flow following any precipitation event. Seepage which eventually becomes part of base flow should not alter the neutral or slightly alkaline condition of groundwater based on the excess alkalinity of local shallow groundwater. Also the extent of surface mining in the Galum Creek drainage basin will already be exerting a major influence on future water quality.

#### Groundwater

Movement of pollutants from the impoundment will be restricted by the nature of earth materials present. The low hydraulic conductivities of the glacial drift present will allow long contact times between leachate and soils. Processes like cation exchange and precipitation of metals due to pH changes, will be enhanced by slow movement of leachate through soils (Griffin et al 1976, Griffin et al 1980, Gibb and Cartwright 1982). Griffin et al (1976) studied the attenuation of several contaminants in leachate by clays. Illite, kaolinite and montmorillinite were mixed with varying proportions of sand in separate constant head percolation columns. In their work, montmorillinite had the highest attenuation capability followed by illite and kaolinite respectively. The authors felt that attenuation capability was related to the number of absorption sites available on each type of clay.

Unconsolidated materials at this site are Wisconsin Peoria loess and Illinoian Glasford formation. The composition of the clay mineral fraction of these materials from some samples in Illinois are described in table 9 from table 5 of Willman and Frye (1970).

Table 9 Clay Mineral Composition  
Glasford Formation/Peoria Loess

	<u>Range %</u>	<u>/</u>	<u>Range %</u>
Expandable Clay Minerals	6-49		28-80
Illinite	36-66		15-55
Kaolinite	15-32		5-20
Chlorite			

Montmorillinitic type clays (expandable clay minerals) are well represented in the geologic materials through which any leachate must pass.

No private or public water supplies would be threatened by leachate contamination. The impermeable nature of the bedrock surface and its shape indicate leachate movement will generally be northwards within glacial drift.

The deep Pennsylvanian and Mississippian sandstones also used for water supplies should be adequately protected from effects of pollutant movement by the thick impermeable layers of underclay, shale and limestone separating them from the lowest of the impoundment. Leakage through these layers is estimated to be less than 10% of the recharge to the deep aquifers. This is based on comparable deposits below the #5 coal here and the Maquoketa shale of northern Illinois. Walton (1965) estimated that this low permeability unit over the Cambrian-Ordovician aquifer in northern Illinois contributed about 10% of the flow to the Cambrian-Ordovician aquifer by leakage. It is reasonable to expect less than that amount of leakage here because large head differentials between the Pennsylvanian and Mississippian sandstones and the strata below the #5 coal do not exist. Otherwise lithologies and thicknesses of the Maquoketa shale and Pennsylvanian strata below the #5 coal are similar.

TABLE 1

## Surface Water Quality Data

Mine: BS#4

Sampling location: 4C-1

1981 Data

DATE	pH	TOTAL Fe (mg/l)	ACIDITY (mg/l)	ALKALINITY (mg/l)	SUSPENDED SOLIDS (mg/l)	TOTAL DISSOLVED SOLIDS (mg/l)	SO <sub>4</sub> (mg/l)	NO <sub>3</sub> (mg/l)	Fl (mg/l)	Mn (mg/l)	Pb (mg/l)	Zn (mg/l)	FLOW (cfs)
12-1	6.8	3.91	-56	62	176	408	180	2.1	0.15	0.29	0.1	0.09	54
11-10	6.8	2.07	-72	78	50	365	102	1.0	0.15	0.15	0.1	0.05	6
10-27	7.2	1.06	-100	106	15	760	232	1.3	0.14	0.11	0.1	0.07	54.4
9-29	7.3	1.52	-120	126	45	2818	225	2.15	0.15	0.23	0.1	0.13	1
8-28	7.5	1.00	-66	72	118	394	180	3.14	0.15	0.10	0.1	0.03	3
7-23	7.4	21.84	-54	60	1124	356	160	*	0.11	0.86	0.1	0.26	1012
6-22	7.7	2.76	-86	92	110	308	70	*	0.18	0.24	0.1	0.07	123
6-3	6.4	8.76	-36	42	422	316	80	*	0.11	0.52	0.1	0.10	374
5-19	6.6	10.97	-46	52	682	226	140	*	0.10	0.75	0.1	0.10	724.5
5-18	6.3	33.42	-46	52	1868	152	192	*	0.11	0.33	0.1	0.27	1172.5
5-11	7.0	0.64	-156	164	9	597	220	4.73	0.14	0.85	0.1	0.04	26
4-21	7.8	3.0	-64	70	43	627	189	5.59	0.17	0.41	0.1	0.07	12.6
4-14	7.3	2.18	-206	212	19	608	330	3.34	0.20	1.38	0.1	0.18	1
3-30	6.9	2.31	-200	206	7	435	210	0.43	0.17	0.78	0.1	0.07	Equipment Failure
3-5	8.2	0.91	-104	112	18	643	222	2.15	0.16	0.33	0.1	0.10	52
2-23	6.4	2.17	-32	54	10	503	180	9.03	0.22	0.06	0.1	0.07	19.1
2-12	6.9	2.17	-14	20	951	268	43	11.61	0.19	0.74	-	-	43.7
Ave.	7.1	5.92	86	89	339	576	174	0.97	0.15	0.48	0.1	0.10	-

V-19

TABLE 2

## Surface Water Quality Data

Mine: BS#4  
Sampling location: 4G-2

1981 Data

DATE	pH	TOTAL Fe (mg/l)	ACIDITY (mg/l)	ALKALINITY (mg/l)	SUSPENDED SOLIDS (mg/l)	TOTAL DISSOLVED SOLIDS(mg/l)	SO <sub>4</sub> (mg/l)	NO <sub>3</sub> (mg/l)	Fl (mg/l)	Mn (mg/l)	Pb (mg/l)	Zn (mg/l)	FLOW (cfs)
12-1	7.0	3.94	-78	84	192	448	288	2.0	0.13	0.37	0.1	0.05	37.1
11-10	6.5	2.71	-78	84	82	575	220	1.0	0.16	0.16	0.1	0.02	10
10-27	6.6	1.52	-114	120	33	1034	300	1.1	0.17	0.16	0.1	0.09	11.4
9-29	7.2	4.24	-58	64	49	1817	120	2.15	0.13	0.33	0.1	0.29	NF
8-28	7.8	1.53	-104	112	50	854	315	3.01	0.15	0.18	0.1	0.11	6
7-23	7.5	28.36	-38	44	1588	224	216	*	0.12	1.19	0.1	0.13	168
6-22	7.5	2.63	-92	98	150	604	200	*	0.12	0.22	0.1	0.10	104.5
6-3	6.8	1.78	-102	108	325	170	325	*	0.18	0.15	0.1	0.04	128.6
5-19	7.0	14.01	-54	60	640	542	140	*	0.11	0.67	0.1	0.07	Out of bank
5-18	6.8	38.22	-72	78	6240	60	212	*	0.10	0.35	0.1	0.15	27
5-11	6.9	0.74	-174	180	14	1868	624	6.88	0.21	0.74	0.1	0.15	1
4-21	7.5	3.1	-80	88	77	810	312	6.02	0.19	0.33	0.1	0.03	11.2
4-14	7.3	0.90	-164	170	33	2293	900	3.01	0.28	0.66	0.1	0.03	1.05
3-30	6.7	0.82	-172	178	27	2067	540	0.86	0.25	0.55	0.1	0.01	Equipment Failure
3-5	7.5	0.61	-236	242	3	953	474	1.29	0.15	0.42	0.1	0.07	8.75
2-23	6.0	1.14	-76	84	28	444	174	5.59	0.20	0.02	0.1	0.04	12.8
Ave.	7.0	6.64	106	112	210	923	316	2.99	0.17	0.41	0.1	0.09	-

V-20



Summary of Selected Groundwater  
Quality Parameters

Table 6

MW-4-3

	<u>Range</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>N</u>
pH	6.6-7.3	6.9	0.2	9
Total Hardness (mg/l as CaCO <sub>3</sub> from mg + Ca)	650-2400	1000	520	9
TDS (R.O.E., mg/l)	677-1920	1480	367	9
Alkalinity (mg/l as CaCO <sub>3</sub> )	390-468	414	23	9
Fe (dissolved, mg/l)	.1-1.4	0.8	0.6	4
Mn (dissolved, mg/l)	.34-1.2	0.77	0.36	4
Zn (dissolved, mg/l)	0.04-0.07	0.05	0.01	4
SO <sub>4</sub> (mg/l)	300-680	490	130	8

Summary of Selected Groundwater  
Quality Parameters

Table 7

MW-4-4

	Range	Mean	Std. Dev.	N
pH	6.3-7.3	6.9	0.3	9
Total Hardness (mg/l as CaCO <sub>3</sub> from Mg + Ca	330-1200	720	310	9
TDS (R.O.E. mg/l)	759-1980	1500	382	9
Alkalinity (mg/l as CaCO <sub>3</sub> )	272-402	344	42	9
Fe (dissolved, mg/l)	0.1-1.4	0.5	0.6	4
Mn (dissolved, mg/l)	0.01-.35	0.14	0.15	4
Zn (dissolved, mg/l)	0.04-0.06	0.05	0.01	4
SO <sub>4</sub> (mg/l)	240-650	500	150	9

Summary of Selected Groundwater  
Quality Parameters

Table 8

MW-4-5

	Range	Mean	Std. Dev.	N
pH	6.5-7.7	7.2	0.4	9
Total Hardness (mg/l as CaCO <sub>3</sub> from mg + Ca)	150-1510	420	450	9
TDS (R.O.E., mg/l)	499-1163	639	200	9
Alkalinity (mg/l as CaCO <sub>3</sub> )	334-390	361	19	9
Fe (dissolved, mg/l)	0.4-2.1	1.2	0.8	4
Mn (dissolved, mg/l)	0.01-0.20	0.14	0.09	4
Zn (dissolved, mg/l)	0.01-0.08	0.04	0.03	4
SO <sub>4</sub> (mg/l)	18-180	110	47	9

## References Cited

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11. Pond, impoundments, banks, dams and embankments.

- A. Describe proposed reclamation for each structure, including a time table and plans for removal and disposal of material. Maps and cross sections should be supplied if appropriate.

The experimental practices area consists of an abandoned refuse pond. The mine safety and health administration approved the abandonment of the pond on December 14, 1981, please refer to page V-26 for a copy of the correspondence.

Reclamation revegetation as outlined in Part VI of this application is complete.

- B. Permanent impoundments, including sedimentation ponds, must be authorized by the Regulatory Authority based upon the requirements of rule 1816.49(a) and must meet design requirements 1816.49(c) thru (j).

There are no permanent water impoundments within the proposed permit area.

1. Include sufficient design data and calculations to substantiate that the design is in accordance with SCS engineering standard 378 "Ponds" or SCS technical release #60 "Earth Dams and Reservoirs."
2. Provide evidence that water quality is to be suitable for the intended use.
3. Indicate the relationship of the impoundment to the post-mining land use.
4. Describe methods of dropping surface runoff over excavated impoundment side slopes. Discuss design criteria to be employed for down drain structures and perimeter diversions.
5. Provide plans of access roads and other use related facilities.

- C. Describe proposed reclamation for all refuse disposal areas including timing of final coverage, depth of final cover, restoration planned for disposal area and restoration planned for borrow areas.

Reclamation revegetation as outlined on Part VI, Page 4 of this application is complete.

- D. If any structure is 20 feet or higher or impounds more than 20 acre-feet provide a stability analysis of each structure which shall include strength parameters, pore pressures, and long-term seepage conditions. Also, to be included is a description of each engineering design assumption and calculation with a discussion of each alternative considered in section design parameters and construction methods.

There are no structures 20 feet in height that impound 20 acre feet or more of water.

U. S. Department of Labor

Mine Safety and Health Administration  
501 Busseron Street  
Vincennes, Indiana 47591



December 14, 1981

Mr. Ervin Anderson  
Supervisor of Environmental Services  
Consolidation Coal Company  
Midwestern Region  
Illinois Surface Operations  
P. O. Box 218  
Pinckneyville, IL 62274

Dear Mr. Anderson:

An inspection on December 7, 1981, of Burning Star No. 4 Slurry Impoundment revealed that the requirements of the abandonment plan for this impoundment had been completed. Therefore, the BS4-S1 Slurry Impoundment, I.D. No. 1211 IL 2024-02, is declared abandoned. If you have any questions concerning this matter, please advise.  
Sincerely,

*Charles A. Rath*  
Acting District Manager  
Coal Mine Safety and Health  
District 8

cc: Mr. John Branum, Mine Engineer  
Mr. Robert Hoffman, Superintendent

PRIME FARMLAND RESTORATION PLAN

The following information must be given, in order for the regulatory authority to evaluate whether the applicant has the technological capability to restore mined prime farmland to equivalent or greater productivity within a reasonable time.

Not applicable. There are no prime farmland soils within the permit area.

A. Premining information

1. The applicant must submit a soils map of medium intensity developed by the Soil Conservation Service or by a qualified individual who has prepared the map which conforms to the standards of the national Cooperative Soil Survey. Indicate preparer of map and any modifications made to SCS prepared maps. Indicate date of map preparation.
2. The areas defined as prime farmland by 7 CFR 657 and listed in "Correlated Soil Mapping Units That Qualify as Prime Farmland in Illinois" August 15, 1978, USDA, SCS, Champaign, Illinois, must be identified in the soil map. Give acreage totals of each prime farmland map unit, and give acreages for each prime farmland map unit, and give acreages for each with respect to areas which will incur actual mining (removal of overburden and extraction of coal) and to areas which will incur other forms of disturbances, roads, ditches, etc.)
3. The applicant must include a description of the original undisturbed soil profile. The description should discuss the following parameters for each soil horizon that collectively constitutes the root zone unless specific depths or horizons are requested.
  - a. Depth and thickness of each horizon (range and average)
  - b. Moist bulk density of each major horizon (use USDA approved method)
  - c. Present pH and state of fertility (P&K) (A horizon only)
  - d. Texture analysis of each horizon (use USDA texture classification)
  - e. If B & C horizons are proposed to be mixed, submit evidence to support proposal.

Soil samples must be taken on the permit site to obtain the material necessary to obtain the above-required information. Sample site locations are to be indicated on the soils map. SCS established values on bulk density may be used in lieu of field investigation.

4. If the information is available, the applicant must include acreage totals of each map unit (soil type and slope classification) of the prime farmlands.

5. The applicant should discuss the history of previous productivity and cropping practices on the prime farmland. Also included, to be discussed, is previous fertilizer application in relation to (3) (c) above.
6. The applicant should provide a list of references or copies of available agricultural school studies, company data or other scientific data for comparable areas that demonstrate the applicant, using this proposed method of reclamation will achieve, within a reasonable time, equivalent or higher levels of yield after mining as existed before mining.

#### B. Mining Operations

1. Describe the equipment to be used in the removal and replacement of each soil horizon. Include a discussion as to how compaction will be held to a minimum.
2. Discuss the timing of the removal and replacement of the horizons with regards to seasons, weather, and regulatory authority testing approval.
3. Discuss how mining operation will impact prime farmlands not to be mined.
4. Discuss how the prime farmland will be identified in the field in order to avoid contamination with non-prime farmland soils.
5. Discuss how the individual soil horizons will be identified in the field in order to avoid contamination with the other horizons.
6. Discuss whether stockpiles will be used or direct placement will be used. If stockpiling will be used, discuss. Locate on mining operations map.
  - a. Discuss length of time stockpiles are to be in place.
  - b. Discuss how prime land stockpiles are to be identified in the field in terms of different horizons and prime vs non prime land piles.
  - c. Discuss any intermittent stockpile relocations as to how, when and why.
  - d. Discuss temporary and/or permanent seeding and revegetation to prevent wind and water erosion.
  - e. Discuss how excessive traffic over stockpiles will be prevented.
  - f. Discuss how contamination by other soil horizons or by fly rock will be prevented.



C. Reclamation Plan and Map

1. Locate on the post-mining reclamation map the location of the replaced prime farmland. Give acreage totals.
2. Discuss how wind and water erosion will be minimized. Include discussions of construction, timing, seeding, seeding equipment to be involved and erosion control structures to be used.
3. Discuss the management of these areas including crop rotations, green manuring level of fertility and personnel responsible for management. Discuss the fertility management.
4. Discuss the timing of the construction of the erosion control structures.
5. Discuss the final graded slopes of the replaced prime farmland areas. Include a discussion of slope lengths.
6. Discuss the replacement of soil horizons with respect to horizon thickness and the total root zone.

D. Measuring Productivity

1. Describe and locate reference areas to be used to evaluate productivity.
  - a. Discuss the proposed management of these areas.
  - b. Include all applicable information as outlined in A. 1,2,3, & 4.
  - c. Indicate ownership of the reference area.
2. If an alternate plan to measure productivity is proposed, describe fully.
3. Indicate a time schedule to meet the required productivity.

E. Additional Information

Include any other relevant information in support of a possible finding by the regulatory authority that the operator has the technological capability to restore prime farmland areas, within a reasonable time, to equivalent or higher levels of yield, as determined by the regulatory authority.

13.

PERENNIAL AND INTERMITTENT STREAM DEVERSION

Not applicable, there are no perennial or intermittent stream diversions within the permit area.

A. Overview, Alternative, Justification:

1. Discuss in detail the reasons for diverting the stream. Include justification and possible alternatives to relocating it.
2. Discuss the general overview of the proposed diversion project. General information should include: temporary, permanent; time length of diversion; single phase, multiphase; restore on placeland, restore in approximate original location after mining; etc.

B. Pre-disturbance information

1. General Information

- a. Name of Stream
- b. Classification (intermittent, perennial)
- c. Total length of segment affected
- d. Total drainage area of existing stream at point where relocation begins (miles<sup>2</sup>) and ends (miles<sup>2</sup>).
- e. Depth of water table adjacent stream and yearly fluctuation.

2. Supply Aerial Photo or Map Illustrating:

- a. Existing stream channel and adjacent land use.
- b. Watershed limits upstream of proposed relocation.
- c. Proposed permit area; property boundaries.
- d. An outline of the 100-year frequency flood plain along the existing channel.
- e. Locations where representative cross sections have been taken.
- f. Riparian habitat (vegetation).
- g. Riffles. List total number.
- h. Pools. List total number.
- i. Meanders. List total number.

3. Plan-Profile Drawings of Existing Stream Showing:
    - a. Stream bed, and significant drops.
    - b. Water surface at low flow.
    - c. Water surface at 100 year flood.
    - d. The locations where representative cross sections have been taken.
  4. Cross-Sectional Drawings of Existing Stream Channel at Representative Locations Showing:
    - a. Water surface at low flow.
    - b. Water surface at 100 year flood.
  5. Describe the habitat Characteristics of the Existing Stream, Including Information On:
    - a. Channelization
    - b. Shade provided by Streambank vegetation
    - c. Composition
    - d. Steepness and elevation of bank
    - e. Riparian vegetation (species, relative abundance)
    - f. Aquatic vegetation species, relative abundance)
  6. Give the Calculated Flow Rate (cfs) and Velocity (ft./sec.) of the Stream at the Locations Designated for Representative Cross Sections on the Existing Stream for:
    - a. Low flow conditions.
    - b. 100 year flood conditions.
- C. Proposed Relocation and/or Restoration Information (see Stream Restoration Criteria Where Applicable for Development of Plan)
1. The proposed construction dates:  
Begin construction \_\_\_\_\_  
End construction \_\_\_\_\_
- Give a detailed description of the construction practices to be followed, and the equipment which will be used.
2. Discuss the erosion control practices to be followed during construction, and the features of the proposed channel which will help minimize erosion of the stream banks in the future.
  3. Discuss the effects this stream diversion will have on downstream water quality, biological communities and water users and describe a monitoring program to measure these effects.
  4. Describe how temporary stream channel diversions will be reclaimed when no longer needed.
  5. Include a revegetation plan.

6. Describe how the new channel spoil will be graded and handled to minimize the impact on the surrounding area.
7. Provide aerial photo or map (scaled) illustrating:
  - a. Proposed stream channel
  - b. Proposed spoil locations
  - c. An outline of the 100 yr. frequency flood plain along the proposed channel
  - d. Locations where representative cross sections have been taken
  - e. Riparian habitat (vegetation)
  - f. Riffles. List total number
  - g. Pools. List total number
  - h. Meanders. List total number
8. Plan - Profile drawings of proposed relocation showing:
  - a. Stream bed, and significant drops.
  - b. Water surface at low flow.
  - c. Water surface at 100 year flood
  - d. Existing gradeline for proposed relocation.
  - e. The locations where representative cross sections have been taken.
  - f. Erosion and sediment control measures.
9. Cross-Sectional drawings of the proposed stream channel at representative locations showing:
  - a. Water surface at low flow.
  - b. Water surface at 100 year flood.
10. Include hydrologic design calculations indicating capacity of relocated stream to accommodate 10 year/24 hour storm for temporary diversion or 100 year/24 hour storm for permanent diversion.
11. Give the calculated flow rate (cfs) and velocity (ft./sec.) of the stream at the locations designated for representative cross sections on the proposed relocation for:
  - a. Low flow conditions.
  - b. 100 year flood conditions.
14. Provide a detailed estimate of the cost of reclamation for the proposed surface mining operation required to be covered by a performance bond. Provide calculation and/or drawings, cross sections, maps, etc. to support the reclamation cost estimate.

Reclamation within the proposed permit area as outlined in Part VI, Page 4 of the experimental practices proposal is complete.

Experimental Practice Proposal

Title: Groundwater quality associated with an above ground slurry disposal system where vegetation is directly established in lieu of soil cover.

Submitted by:

Consolidation Coal Company  
Illinois Surface Operations  
Pinckneyville, Illinois  
December 1982

## Introduction

Current regulations stipulate covering coal processing wastes with 4 feet of non-toxic, non-combustible materials within 90 days after cessation of active use (30 CFR 715.17(g)(4)). There are several questionable issues relative to these requirements. (1) The instability of materials normally associated with slurry ponds recently deactivated, is a direct safety consideration. The equipment necessary to replace this cover will, in many cases, be unable to traverse these types of materials. (2) Future economic conditions may be such that profitable coal recovery operations can be implemented. At the present time, in the State of Illinois, several secondary recovery operations exist. (3) The specific requirements for the replacement of 4 feet of soil materials are somewhat arbitrary. Significant savings could be realized with lesser amounts or zero soil cover replacement while achieving adequate vegetational establishment. Scientific evidence exists to support these alternative methods.

The effects from seepage of an above ground slurry impoundment in low hydraulic conductivity soils on local groundwater resources are unknown. Once covered with vegetation to prevent erosion and airborne dust problems, such a disposal method may be environmentally sound.

The purpose of this experimental practice, to be carried out at Consolidation Coal Company's Burning Star #4 Mine in Perry County, Illinois, is to determine the effects on groundwater from an aboveground slurry impoundment that has been adequately vegetated by direct methods.

## Objectives

- (1) Monitor groundwater quality within the impoundment, in the vicinity of the impoundment and evaluate potential for migration of pollution.
- (2) Establish a permanent stand of vegetation, by direct methods, on the slurry pond at Burning Star No. 4. Vegetative ground cover will be adequate to assure compliance with the appropriate requirements of the law. (30 CFR 715.20f)

## Justification

A project of this nature provides a unique opportunity to address the many problems associated with reclamation of areas used for coal processing waste disposal. If a vegetative cover can be established that meets the requirements of the applicable laws, without the use of soil cover, and if contamination of groundwater does not occur, significant advantages can be realized.

- 1) The safety problems associated with soil coverage activities on unstable materials, can be avoided.

- 2) Soil borrow areas need not be developed, thereby lessening the surface area disturbed by surface mining.
- 3) Significant reductions in reclamation costs can be realized, while providing adequate environmental protection through these alternative reclamation methods.
- 4) When secondary recovery of these refuse materials becomes economically feasible, costly removal of replaced soil materials would not be necessary.

This project is important for the development of a data base in determining the effects of slurry refuse disposal on groundwater systems. Previous research into this subject area is insufficient.

Applications of this information will also be of fundamental importance to the concepts and objectives of the abandoned mined lands work currently underway within the State of Illinois. If direct methods of vegetation establishment are demonstrated to be viable alternatives to soil coverage activities, this will have a significant impact on the usage of those monies available for abandoned mined lands reclamation.

#### Slurry Refuse Chemical Characteristics

A total of 12 slurry refuse samples were obtained from the slurry impoundment on 1-24-84. The impoundment was divided into 4 segments of approximately equal area (the wet area on the west side was excluded from consideration). Samples were taken at approximately the center of each segment (see Figure 4 for locations). A 1 inch diameter soil sampling tube was used to collect samples of the 0-12", 12-24" and 24-36" depth intervals. The results are shown in Table 1. Specific conductance is for an extract from a saturated paste and pH is for a saturated paste.

TABLE 1

BS#4 Experimental Practice Proposal  
Slurry Refuse Chemical Analyses

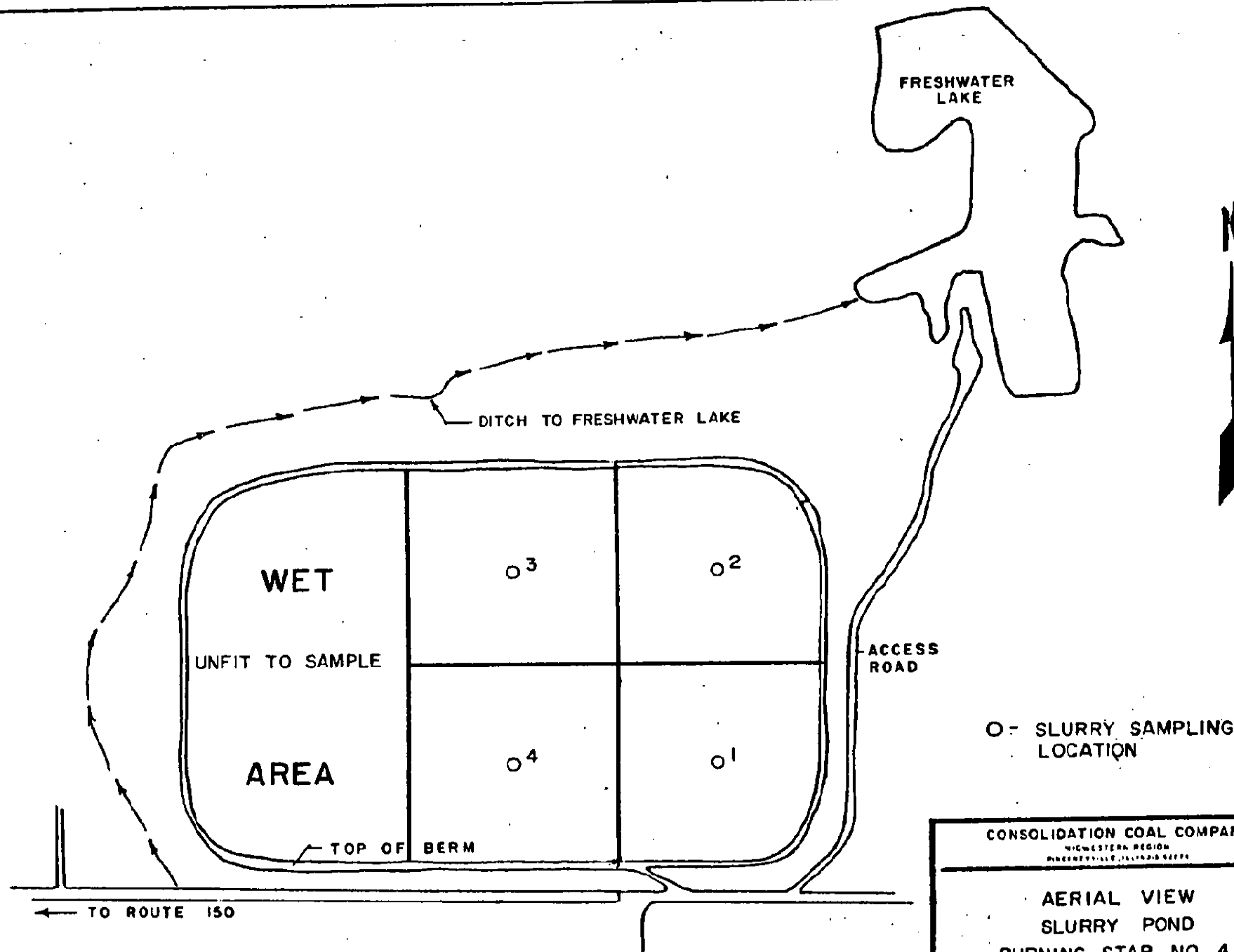
Sample ID	Neutral. Potential *	% Pyritic Sulfur	Net Neut. Potential	pH	Specific Conductance **
#1, 0-12"	56.0	1.06	+22.9	7.50	1450
#1, 12-24"	10.0	0.92	-18.8	5.45	1900
#1, 24-36"	112.0	3.55	+ 1.1	6.85	1850
#2, 0-12"	10.5	0.63	- 9.2	6.45	1420
#2, 12-24"	3.2	4.40	- 134	4.35	1500
#2, 24-36"	49.5	8.79	- 225	6.50	2200
#3, 0-12"	30.2	1.63	-20.7	6.90	1590
#3, 12-24"	70.0	1.77	+14.7	7.65	1450
#3, 24-36"	97.0	2.43	+21.1	8.10	1210
#4, 0-12"	52.0	2.44	-24.2	6.10	1450
#4, 12-24"	32.5	3.80	-86.2	5.70	2080
#4, 24-36"	96.5	4.93	-57.6	6.55	2050

\* UNITS = Tons  $\text{CaCO}_3$  equivalents per 1000 tons material

\*\* UNITS = micromhos/cm



VI-2-b



O = SLURRY SAMPLING LOCATION

CONSOLIDATION COAL COMPANY  
NORTHWESTERN REGION  
PINECREEK, ILLINOIS 62450

AERIAL VIEW  
SLURRY POND  
BURNING STAR NO. 4

APP. 1" = 400'	DATE
D.S.	2-28-84
PERRY	SS 4W
	FIG. 4

## Literature Review

Enactment of PL 95-87 has created considerable interest in the reclamation of coal processing wastes, particularly as related to alternatives to the 4 foot cover requirements. Not only have lesser depths of soil cover been investigated but there has been a considerable number of projects initiated relative to direct liming, fertilizing and seeding methods on coal refuse, and wastes from other mineral development.

Sorrell (1974) and Davidson (1974) were able to establish herbaceous cover on mine-waste piles in Pennsylvania with application of lime, fertilizer and hardwood bark as amendments. Barthauer et. al. (1971) and Kosowski (1973) demonstrated that vegetative cover can be directly established on refuse at the New Kathleen site in Perry County, Illinois. Czapowskyi et. al. (1968) had success with crown vetch established by direct methods on coal breaker refuse. Shetron and Duffek (1970) demonstrated the applicability of direct methods on iron mine tailings. Medvick and Grandt (1976) documented successful establishment by direct methods for projects initiated by the Illinois Department of Mines and Minerals, Division of Land Reclamation. Their test plots, which received annual maintenance, were still vegetatively covered after three years. These plots were evaluated by Sukthumrong (1975). Campion and Brenner (1981) demonstrated successful direct establishment of vegetation on coal refuse in Wise County, Virginia.

Extensive work has been done in Illinois relative to direct establishment methods particularly in reference to the use of reedgrass (*Phragmites australis*), and the development of wet lands. The bulk of these efforts have been undertaken by the staff of the Cooperative Wildlife Research Laboratory (CWRL) at Southern Illinois University at Carbondale. The early mined land inventories produced by the CWRL documented the natural occurrence of reed grass in mine influenced environments, including refuse areas (Haynes & Klimstra 1975; Nawrot et. al. 1977). Several projects initiated by the CWRL have demonstrated the effectiveness of reed grass for the establishment of wetland habitat on slurry ponds without the use of soil cover (Nawrot 1981; Nawrot et. al. 1981; Nawrot and Yaich 1982). These latter references directly preceded or are a direct outgrowth of an experimental practice approved by the Office of Surface Mining for wetland establishment on a coal slurry pond in Illinois.

It is essential to realize two important considerations when reviewing the previously cited research projects. (1) None have addressed the issue of groundwater quality as related to coal slurry disposal. (2) None have documented the long range success of direct vegetational methods. This proposal is designed to address both of these issues.

Hiller (1981) measured leachate quality as related to different refuse revegetation methods. His first year results showed similar leachate quality between areas soil covered and those directly established to vegetation.

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Several authors have reported experimental findings on the changes in leachate quality from spoils with time in natural or simulated weathering cycles. (Vimmerstedt and Struthers, 1968, Infanger, 1980 and Mercier, 1975). Amounts of soluble salts contained in the leachate were reported to diminish with time as laboratory leaching columns were flushed with water. These findings held true, independent of the pH of the leachate. Differences do exist in the amounts of certain chemical species leached between spoils having different leachate pH values.

A permanent stand of vegetation should in the long run improve the quality of seepage from a coal slurry refuse impoundment. Stabilization of the surface by vegetation will break the cyclical pattern of weathering followed by erosion to expose new materials for weathering. Additionally the neutralizing capacity of infiltrating water would be increased by decay of organic material (Caruccio, 1968). This decay in a layer of humus can raise  $pCO_2$  in soil air creating additional carbonic acid ( $H_2CO_3$ ). Any calcium carbonate present will be more easily dissolved by the additional  $H_2CO_3$  creating bicarbonate ion  $HCO_3^-$ , the principle neutralizing agent in groundwater. A layer of organic mulch would also use up some  $O_2$  to decay and therefore reduce oxidation of pyritic materials (Martin, 1974).

Zell (1982) in a compilation of research needs of the surface coal mining industry included the need to investigate the impact of gob and slurry disposal on surface and groundwater regimes. This is an indicator of the lack of background data relative to groundwater impacts from refuse disposal.

## Methods

### Vegetation

The slurry pond at Burning Star #4 Mine in Perry County, Illinois (Part of S.  $\frac{1}{2}$  of S.E.  $\frac{1}{4}$ , Section 33, Township 5S, Range 4W) is similar to many recently deactivated slurry systems. Typical horizontal patterns in the chemical and physical characteristics were identified upon sampling. The higher areas associated with the discharge point are characterized by large particle sizes, brown color and low pH levels (4.1). The areas closer to the decant are characterized by very fine particles and slimes, black color, higher pH levels (7.3), and water table just under the surface.

The initial amendments of lime, fertilizer and seed were therefore designed to reflect these differences in the nature of the slurry. These activities were completed in April 1982, on the 56 acre slurry pond at BS#4. Approximately 6 acres associated with the discharge point were limed at the rate of 15 ton/ac. This Jonesboro Ag. lime was incorporated to approximately 8". The entire pond was then fertilized and seeded by airplane at the following rates:

100 #/ac - 34.0.0	25 #/ac japanese millet
300 #/ac - 18.46.0	10 #/ac weeping lovegrass
500 #/ac - 0.0.60	3 #/ac Blackwell switchgrass

These materials were then harrowed for incorporation by dragging a small ag. harrow with a three wheeled all terrain recreational vehicle. (It was not possible to cover the entire pond even with high flotation tires).

In addition to the grasses applied, and in consideration of the differences in microenvironment provided by the high water table towards the decant, reedgrass (Phragmites australis) rhizomes were planted.

Rhizomes were collected from a population growing in slurry at the New Kathleen site, southwest of Du Quoin, Illinois. They were protected at all times to prevent drying, cut into four node lengths and outplanted by cutting a slot with a tile spade, placing the rhizome vertically in the slot and heel closing the hole. Approximately 12,000 rhizomes were planted according to the following design. Wind break columns were established east to west. These columns consisted of 4 rows planted on 6 foot centers. Columns were spaced 100 feet apart and covered the entire pond excluding the 6 acres associated with the discharge.

In August of 1982 additional fertilizer and seed was applied by aerial methods as follows:

50 #/ac - 34.0.0	25 #/ac Tall Fescue
100 #/ac - 18.46.0	25 #/ac Orchardgrass
300 #/ac - 0.0.60	10 #/ac Yellow sweetclover

Future plantings will include trees and shrubs in the appropriate areas with higher elevations. All vegetation will be maintained as necessary to assure sufficient cover in compliance with the appropriate regulations. This maintenance program will continue for a maximum of 5 years, after which the vegetative cover will be evaluated for its ability for self perpetuation. This vegetative system will provide for suitable wildlife habitat and adequate wind and water erosion control.

## Methods

### Groundwater Monitoring

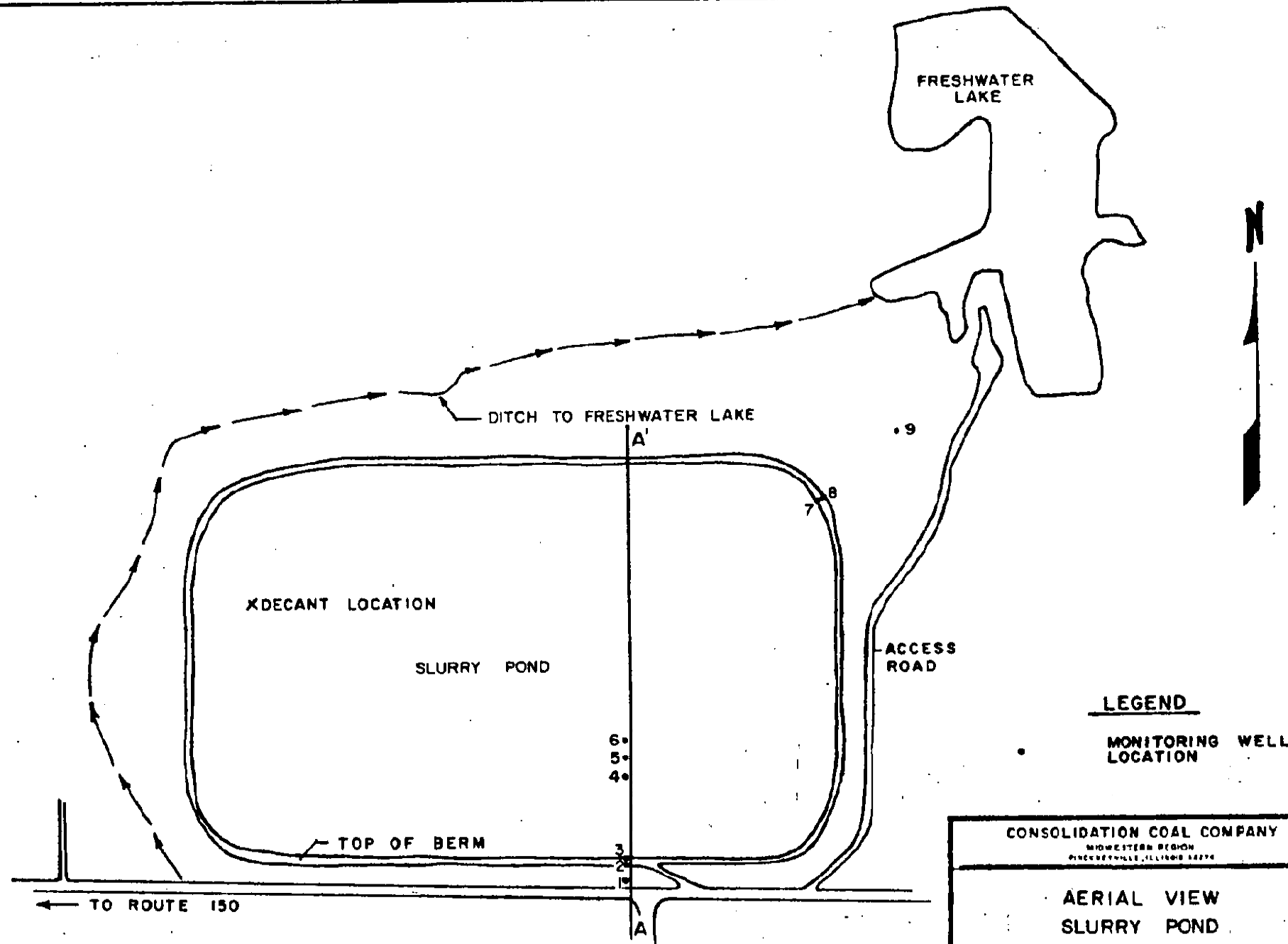
Initially nine (9) monitoring wells will be established. Minor changes in the layout of monitoring wells may occur later due to information gathered from the first nine. Figure 1 shows a plan view of the site detailing the proposed areal arrangement of monitoring wells. An idealized cross-section (Figure 2) through the impoundment and down to top of bedrock illustrates the vertical arrangement of wells. Monitoring wells 7, 8 and 9 will repeat the positioning of numbers 1, 2 and 3 except that #9 will be farther from the toe than #1.

With this arrangement of monitoring wells it will be possible to determine the quality of water within the coal slurry refuse. Wells 5 and 6 will provide a check for stratification of water quality and well #4 will determine any immediate effects of natural earth materials on leachate quality. Changes in groundwater quality with distance from the impoundment will be provided by monitoring wells 1, 2, 3, 7, 8 and 9.

A quantitative estimate of seepage is also a goal of the proposed study. Accordingly the shape of the watertable in the vicinity of the impoundment will be determined by the proposed monitoring wells. To determine the amount of seepage from the impoundment the hydraulic conductivity (K) of the coal slurry refuse, the levee material and the surrounding soils must be known. Bail tests will be conducted using the monitoring wells installed to determine in situ hydraulic conductivity (Bouwer and Rice, 1976).

Referring to Figure 2 it is anticipated that a condition known as groundwater mounding will be present at the site. This is a result of the increased elevation of the impoundment and an estimated hydraulic conductivity of the coal slurry refuse much greater than that of the surrounding earth materials. Water infiltrating after a rain will not be readily accepted into the surrounding watertable therefore causing a buildup within the impoundment. Given this situation flow (seepage) out of the impoundment will be strongly horizontal (tangent rule for flow direction at boundaries of materials with different hydraulic conductivities). Use of the Darcy Equation ( $Q=KiA$ ) to calculate seepage quantity in this situation requires that A (cross-sectional area through which flow occurs) be calculated as the length of the perimeter times the saturated thickness of the soil near the toe of the levee (D in Figure 1), not the area of the bottom of the impoundment (Cedergren, 1977).

8-1A



# LEGEND

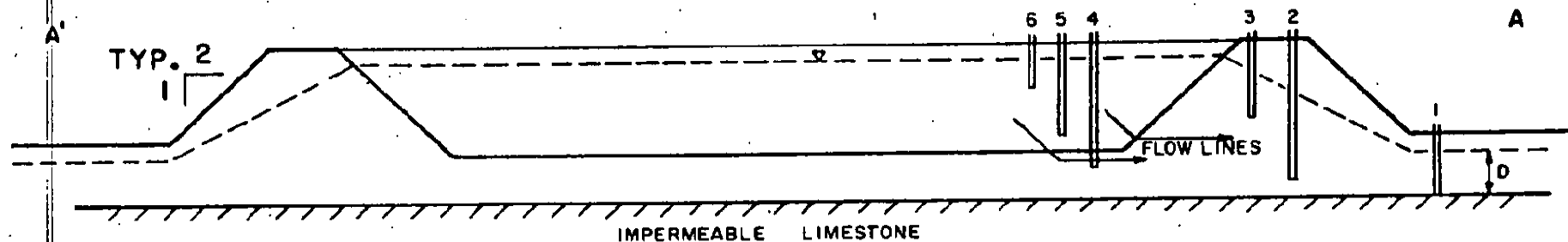
MONITORING WELL LOCATION

CONSOLIDATION COAL COMPANY  
MIDWESTERN REGION  
PINEBURYVILLE, ILLINOIS 62776

AERIAL VIEW  
SLURRY POND  
BURNING STAR NO. 4

APP. 1" = 400'	DATE
D.S.	12/3/82
PERRY	58
4W	FIG. 1

6-1A



SCALE: VERT. - 1" = 50'  
HORZ. - NONE

CONSOLIDATION COAL COMPANY  
MIDWESTERN REGION  
SANDERSVILLE, ILLINOIS 62458

IDEALIZED CROSS SECTION  
SLURRY POND  
BURNING STAR NO. 4

DATE	DATE	DATE	FILE NO.
D.S.	APP'D	12/3/82	
PERRY	53	4W1	FIG. 2



Groundwater samples will be taken following two procedures recommended by Gibb et al. (1981). Wells with poor production capabilities (transmissivity 100 gpd/ft) will be pumped until one well volume of water has been removed. The well will be allowed to recharge for a short period of time and then a water sample will be collected from the pump discharge. Wells with better production capabilities will be pumped prior to sampling based on a curve relating % Aquifer Water in the discharge to the length of time pumping continues.

Water samples will be divided into 3 parts in the field.

- 1) Field-filtered (0.45 micrometer membrane filter) to determine Cl, Hardness, Na, TDS and  $SO_4$ .
- 2) Field filtered, acidified (0.45 micrometer membrane filter). Filtrate will be acidified with  $HNO_3$  to a pH of 3.0 or less. The following determinations will be made: Ca, Fe, Mg, Mn and Zn.
- 3) Unfiltered, settled

The following determinations are made on aliquots of the clear supernatant solution: acidity and alkalinity.

pH and Temperature will be determined at each monitoring site. Collection procedures are described in Brown et. al. (1974).

In addition, static water levels will be monitored monthly for the first 6 months and quarterly thereafter. Sample collection will also follow this timetable.

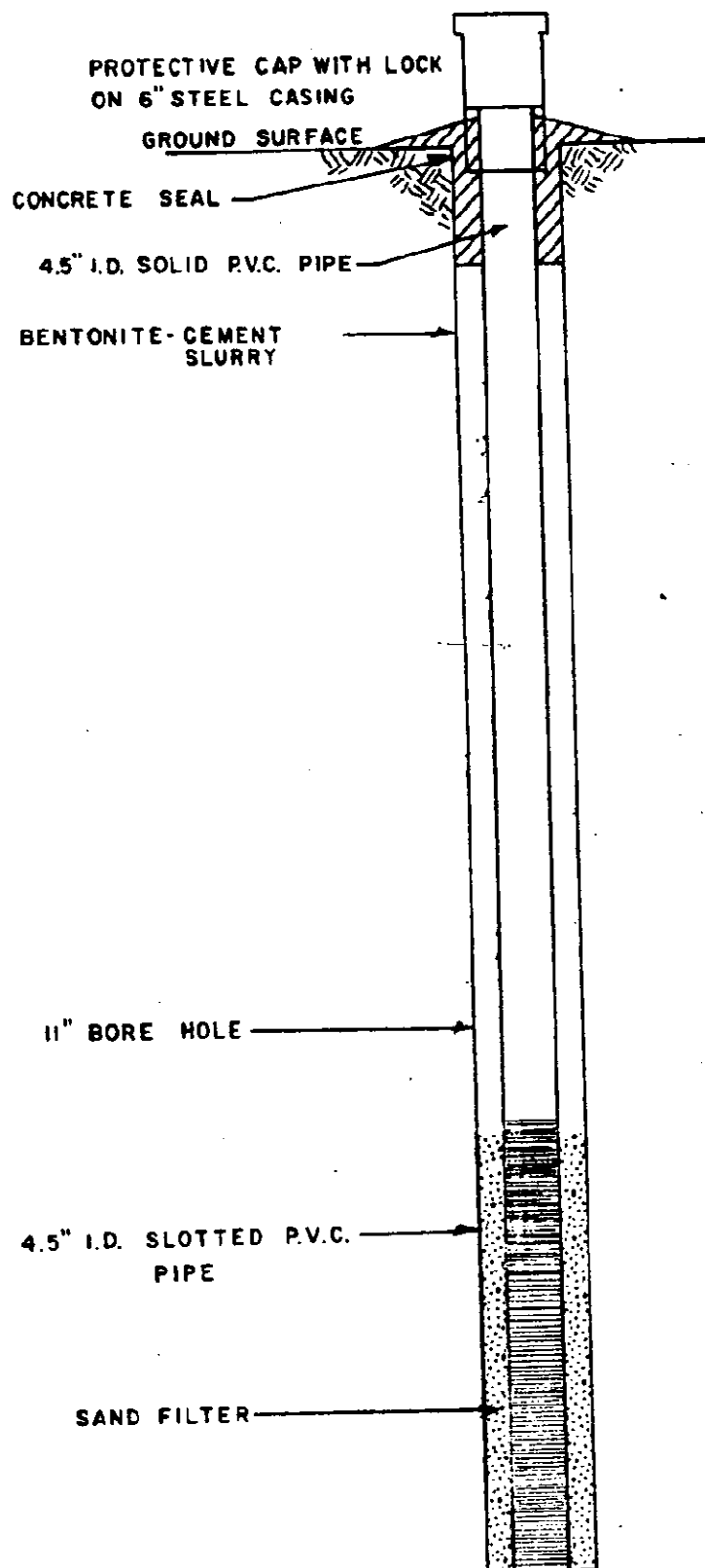
Monitoring wells will be constructed of  $4\frac{1}{2}$ " I.D. PVC pipe. Approximately 10 feet of screened interval will be installed depending on the well in question. Figure 3 shows a typical well construction diagram. A submersible 4.0" pump will be used to develop the wells and collect water samples.

#### Project Duration

In order to adequately quantify the impact on groundwater of aboveground slurry disposal and demonstrate the permanence of the vegetative treatment, it is proposed that this project be implemented for a 10 year period.

A ten year monitoring period will be necessary for the following reasons:

- 1) To allow adequate time for the primary weathering processes to occur.
- 2) To monitor changes in groundwater quality near the site due to the impermeable nature of the earth materials present.
- 3) To define the self sufficiency of the vegetative cover.



**FIGURE 3**

WELL CONSTRUCTION DIAGRAM  
BURNING STAR No. 4

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# SEE LARGE FORMAT MAP OR PLAN SHEET

## DESCRIPTION:

W1458990016  
Consolidation Coal Burng Star4  
16 PERMIT IL0052795  
07/19/2010 DOC ID 2568945

	Type or Description	SEE COLOR	Date of Plan	Figure
1.	North Field/East Soils Map	N	10/26/1984	Map C
2.	North Field/East Mining Operations Map	N	09/06/1984	Map D
3.	North Field/East Land Reclamation Map	N	09/06/1984	Map E
4.	Surface Drainage Control Plan Map	N	10/31/1984	Map F
5.	North Field/East Land Reclamation Map	N	09/06/1984	Map E
6.	Incline and Final Cut Profiles	N	01/01/1901	Map E pg 1 & 2
7.	Pre and Post Mining X-Sections	N	01/01/1901	NA
8.	Surface Drainage Control Plan Map	N	10/31/1984	Map F
9.	Mining Operations Map	N	09/16/1983	Map D
10.	Topographic Map	N	06/01/1983	Map A
11.	Pre-Mining Land Use Map	N	06/01/1983	Map B
12.	Slurry Impoundment Site Map	N	08/30/1983	Map C
13.	Mining Operations Map	N	06/01/1983	Map D
14.	Land Reclamation Plan	N	06/01/1983	Map E
15.	Geologic cross Sec 3 & 4	N	08/31/1983	NA
16.				